
GPS AutoSteer System

Installation Manual



Supported Vehicles

John Deere Combines

9650 STS	9660 STS	9550 CTS	9400 Walker	9600 Walker
9750 STS	9760 STS	9650 CTS	9410 Walker	9610 Walker
9560 STS	9860 STS	9660 CTS	9500 Walker	9650 Walker
			9510 Walker	9660 Walker
			9550 Walker	

Non-AutoTrac Ready

LEGAL DISCLAIMER

Note: Read and follow ALL instructions in this manual carefully before installing or operating the AutoSteer system.

Note: Take careful note of the safety information in the Safety Information section and throughout this manual.

The manufacturer disclaims any liability for damage or injury that results from failure to follow the instructions and warnings set forth herein.

Please take special note of the following warnings:

1. There is NO obstacle avoidance system included in the manufacturer's product. Therefore, users must always have an operator on the equipment when the AutoSteer system is in use to look for any obstacles including people, animals, trees, ditches, buildings, etc.
2. During installation of the AutoSteer system and during the Calibration and Tuning processes the vehicle's wheels turn from side to side and the vehicle moves. Be sure that all people and obstacles are clear of the vehicle before installation, calibration and tuning, or use of the AutoSteer system.
3. Use of the AutoSteer system is NOT permitted while the vehicle is on public roads or in public areas. Ensure that the system is OFF before driving on roads or in public areas.

Special Requirements

Tools

This list consists of the tools required to complete the installation. The installer is assumed to have a complete set of common installation tools.

8mm socket and ratchet	1/2" wrench	16mm wrench
10mm socket and ratchet	9/16" wrench	16mm socket and ratchet
13mm socket, ratchet and extension	3/4" wrench	4mm Allen wrench
15mm socket and ratchet	13/16" wrench	5mm Allen wrench
24mm socket and ratchet	7/8" wrench	1/2" socket and ratchet
Electrical tape	15/16" wrench	#1 Phillips screwdriver
Tape measure 12 ft (3.6 m) minimum	1" wrench	#2 Phillips screwdriver
5/32" Allen wrench	1 1/16" wrench	#2 Phillips stubby screwdriver
1/8" Allen wrench	1 1/8" wrench	Hack saw
1/4" Allen wrench	1 1/4" wrench	Step ladder
3/16" Allen wrench	15mm wrench	Side cutters
3/8" open wrench	13mm wrench	
7/16" wrench	24mm wrench	



Safety Information



Warning Alerts


The AutoSteer system installer and manufacturer disclaim any responsibility for damage or physical harm caused by failure to adhere to the following safety requirements:



- As the operator of the vehicle, you are responsible for its safe operation.
- The steering system is *not* designed to replace the vehicle operator.



Note: Verify that all screws, bolts, nuts, hose connections and cable connections are tight after the final installation of the AutoSteer system on the vehicle.



	<div data-bbox="670 779 933 821"> WARNING</div> <p data-bbox="435 848 1092 936">To avoid electrical shock hazards, remove the Roof Module from the vehicle before driving under low structures or low electrical power lines.</p>
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	<div data-bbox="670 1083 933 1125"> WARNING</div> <p data-bbox="435 1152 1092 1297">To prevent injury from falling, ensure you are in a stable position on the vehicle when installing or removing the Roof Rail and Roof Module. If the vehicle does not provide a safe platform, use a ladder to safely access the vehicle roof while installing or removing the Roof Rail and Roof Module.</p>
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	<div data-bbox="670 1415 933 1457"> WARNING</div> <p data-bbox="435 1484 1092 1572">To prevent accidental death or injury from being run over by the vehicle, never leave the vehicle's operator chair with the AutoSteer system engaged.</p>
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	<div data-bbox="428 277 1089 348"> WARNING</div> <div data-bbox="428 348 1089 522"><p>High-Pressure Fluid Hazard</p><p>Read the Owner's Manual before installation. Wear hand and eye protection while performing hydraulic system maintenance. Relieve hydraulic system pressure before servicing the hydraulic system.</p></div>
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	<div data-bbox="428 609 1089 680"> WARNING</div> <div data-bbox="428 680 1089 825"><p>To understand the potential hazards associated with the operation of AutoSteer equipment read the provided documentation before installing the AutoSteer system on a vehicle.</p></div>
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	<div data-bbox="428 913 1089 984"> WARNING</div> <div data-bbox="428 984 1089 1155"><p>To prevent the accidental engagement of the AutoSteer system and loss of vehicle control while driving on roads, shut down the AutoSteer system (exit the program). Never drive on roads or in public areas with the AutoSteer system turned on.</p></div>
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	<div data-bbox="428 1243 1089 1314"> WARNING</div> <div data-bbox="428 1314 1089 1457"><p>Do not stand close to the wheels and do not move the machine while you are adjusting the relief valve. Turn off the engine and engage the parking brake before standing under or next to the machine.</p></div>
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Caution Alerts



The AutoSteer system installer and manufacturer disclaim any responsibility for damage or physical harm caused by failure to adhere to the following safety requirements:

	 CAUTION
	The Roof Module must be removed when transporting or driving the vehicle at speeds above 30 mph (50 km/h). The Roof Module can possibly detach due to wind loads at higher speeds.

	 CAUTION
	The AutoSteer system does not detect obstacles in the vehicle's path. The operator must observe the path being driven in order to avoid obstacles.

	 CAUTION
	When engaged, the AutoSteer system controls only the steering of the vehicle. The operator must control the speed of the vehicle.

	 CAUTION
	The AutoSteer system must be powered OFF when installing or removing the Roof Module.

	<div data-bbox="672 296 927 338"> CAUTION</div> <p data-bbox="436 365 1081 483">The Roof Module must always be firmly secured to the Roof Rail using the included hardware whenever the vehicle is in operation to prevent the Roof Module from releasing from its bracket and falling.</p>
---	---

Vehicle Requirements

The vehicle steering and hydraulic systems must be in good working order before installing the AutoSteer system. Check for loose or worn parts. Before installing the AutoSteer system drive the vehicle and confirm that it steers straight and the wheels can be turned from lock to lock. Check the steering system hydraulic hoses and connections to ensure there are no oil leaks.

The vehicle electrical system and battery must be in good working order.

The vehicle must be non-AutoTrac Ready. AutoTrac Ready model vehicles require a different installation kit. Contact your AutoSteer dealer for the correct installation kit.

The vehicle should be fully cleaned before installing the AutoSteer system. A clean vehicle improves the overall installation and cable routing and also reduces the chance for oil contamination when the hydraulic connections are opened. It is important to clean the area around the steering unit (Orbitrol), under the cab and behind the rear cab cover.

Important Information

Note: Verify all screws, bolts, nuts, hose connections and cable connections are tight after the AutoSteer system final installation.

Technical Support

Refer to your owner's manual for technical support information.

Contact Information

Refer to your owner's manual for contact information.

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Installation Overview

This **Installation Overview** chapter contains part numbers, kit overview diagram, cabling diagram and the installation procedure for the John Deere Installation Kit.

- *Kit Overview*
 - *Assemblies*
 - *AutoSteer Valve Kit Components*
 - *Hose Kit Components*
 - *Bracket Kit Components*
- *Installation Procedure Outline*
- *Cable Diagram*

Note: If you are installing an electric steering wheel actuator such as OnTrac II, skip the SA Module, Steering Valve connection and System Cable connection installation provided in this manual. Refer to your electric steering product manual for additional instructions.

This installation guide describes the installation of the AutoSteer system on several models of John Deere combines. The AutoSteer installation kit PN: 188-0031-01 is used on these series of combines. The vehicle specific sub-assemblies for the combine series are listed in *Table 1-1*.

Table 1-1 Part Numbers

John Deere 9000 Combines
152-0033-01
153-0001-01
500-0303-01

Kit Overview

Figure 1-1 AutoSteer Kit Components (PN: 188-0031-01)

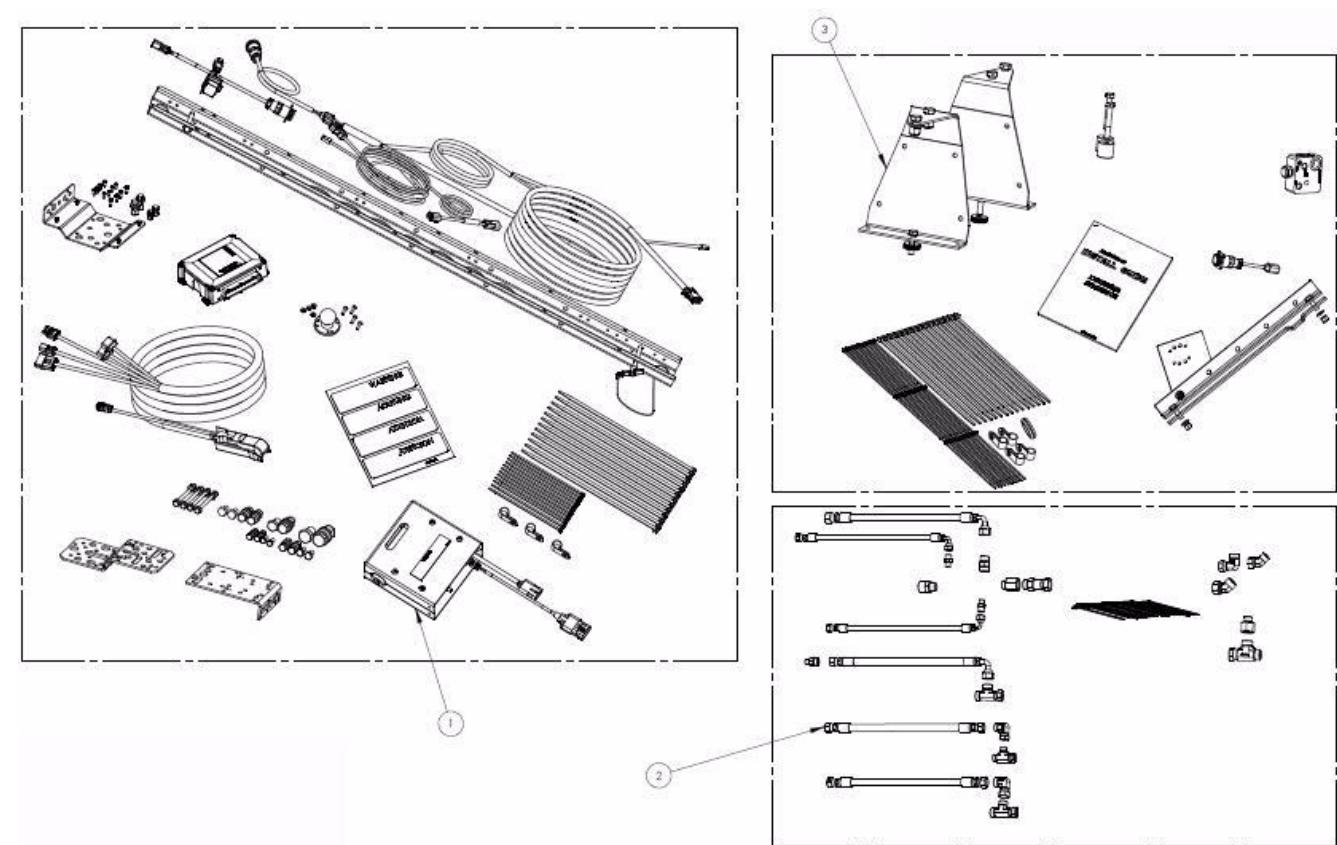


Table 1-2 AutoSteer Kit Components (PN: 188-0031-01)

Item	Component	Part Number
1.	AutoSteer Valve Kit	153-0001-01
2.	Hydraulic Hose Kit	500-0303-01
3.	Bracket Kit	152-0033-01

Assemblies

The AutoSteer vehicle installation kit contains the following components:

- AutoSteer Valve Kit Components
- Hose Kit Components
- Bracket Kit Components

AutoSteer Valve Kit Components

Figure 1-2 Installation Kit Sub-Assembly (PN: 153-0001-01)

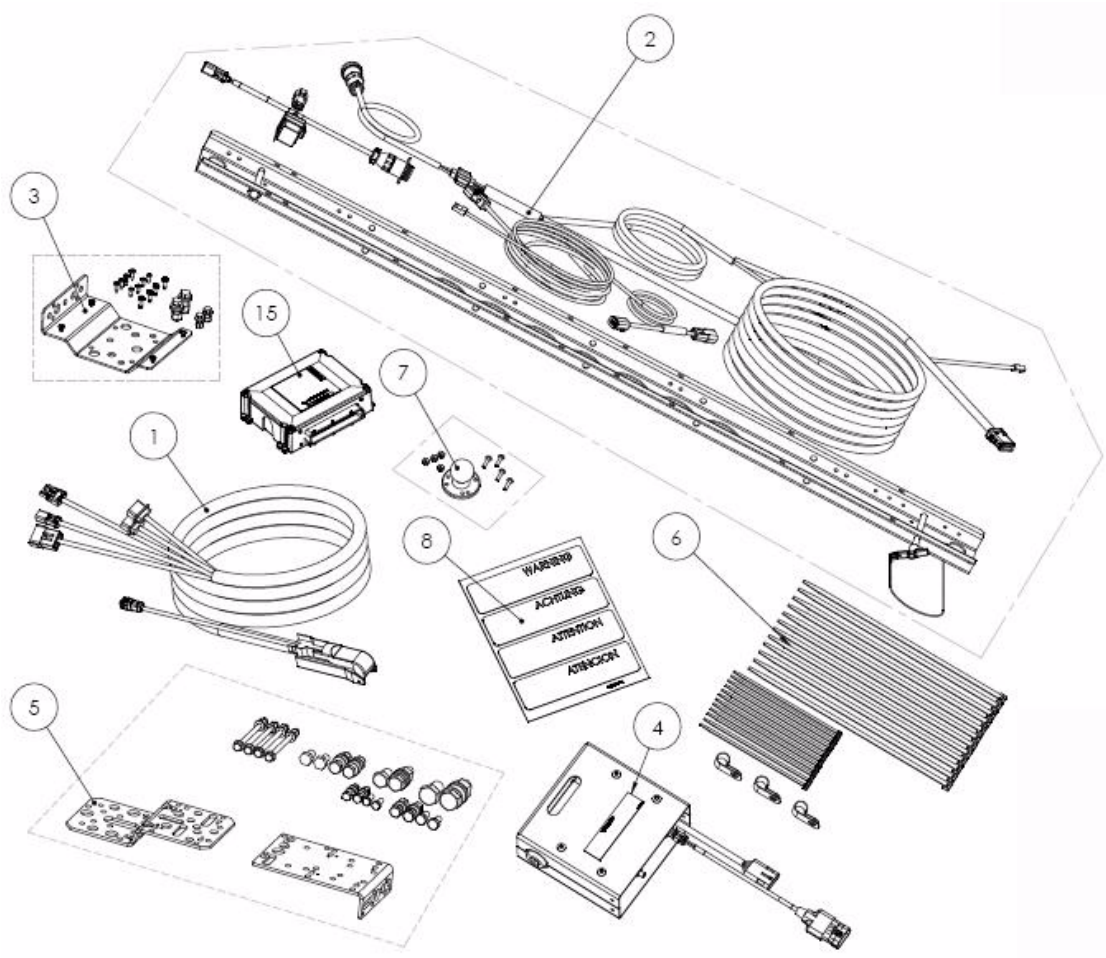


Table 1-3 Installation Kit Sub-Assembly Components (PN: 153-0001-01)

Item	Component	Part Number
1.	SA Module Harness	201-0371-02
2.	Common Kit	200-0497-02
3.	SA Module Bracket	200-0190-01
4.	AutoSteer Valve	200-0457-01
5.	Steering Valve Brackets	200-0434-01
6.	Mounting Hardware	200-0076-01
7.	RAM Mount	200-0508-01
8.	Warning Labels	603-0074-01

Item	Component	Part Number
15.	SA Module Assembly	200-0206-01

Hose Kit Components

Figure 1-3 Hose Kit Components (PN: 500-0303-01)

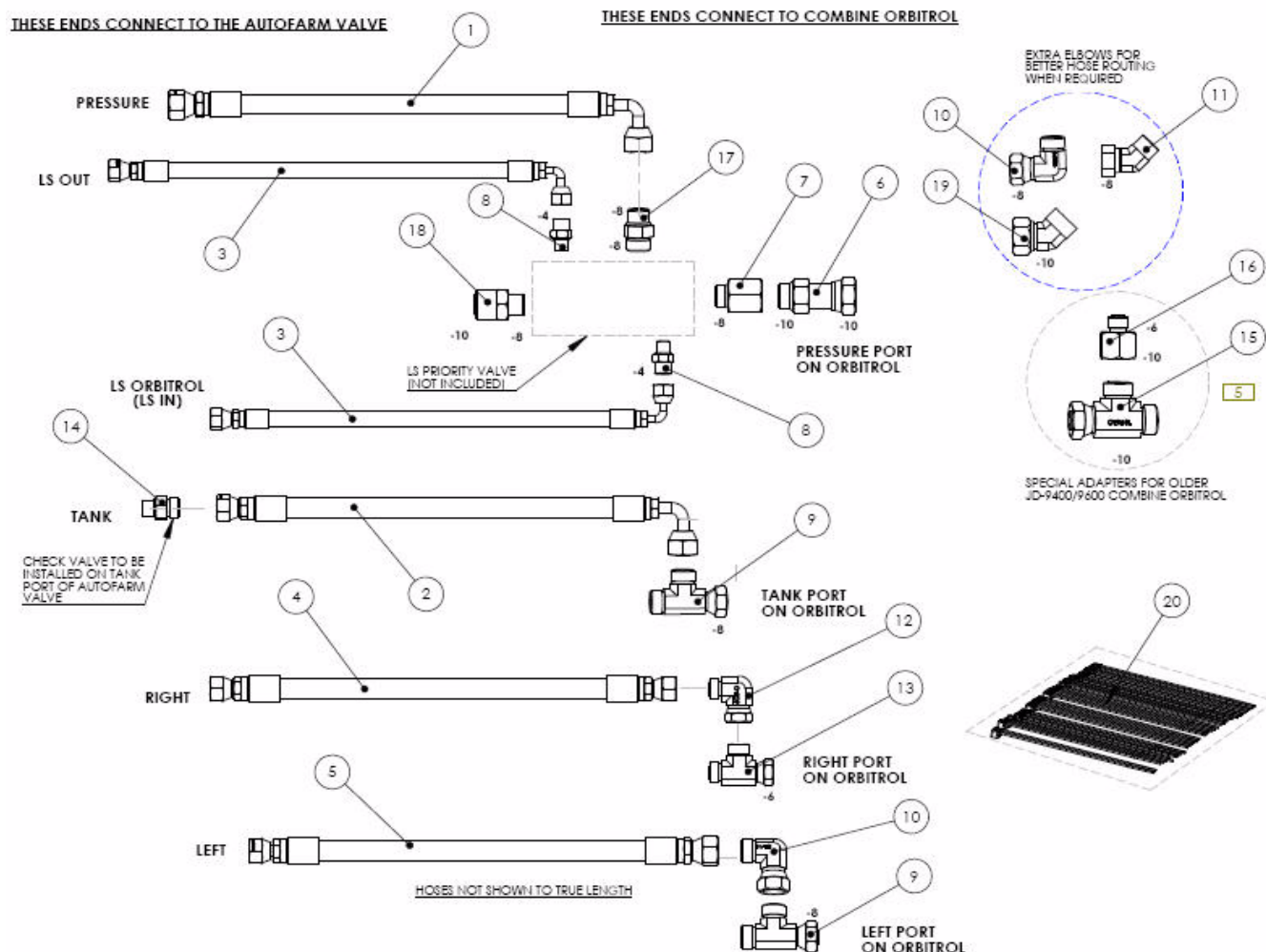


Table 1-4 Hose Kit Components (PN: 500-0303-01)

Item	Component	Part Number
1.	Hose Assembly 3/8" x 58"	F451TC-JCJ9080806-58
2.	Hose Assembly 3/8" x 60"	F451TC-JCJ9060806-60
3.	Hose Assembly 1/4" x 60"	F451TC-JCJ9040404-60
4.	Hose Assembly 3/8" x 60"	F451TC-JCJC060606-60

Item	Component	Part Number
5.	Hose Assembly 3/8" x 60"	F451TC-JCJC060806-60
6.	Adapter	10 F65OL-S
7.	Adapter	8-10 F5OG5-S
8.	Adapter	4 F5OLO
9.	Adapter Run Tee	8 R6LO-S
10.	Adapter Elbow	8 C6LO
11.	Adapter 45 Degree	8 V6LO-S
12.	Adapter 90 Degree	6C6LO
13.	Adapter Run Tee	6 R6LO
14.	Check Valve	DT-370-MOMS-65
15.	Adapter Run Tee	10 R6LO-S
16.	Adapter Expander	10-6 TRLON-S
17.	Adapter	8 F5OLO
18.	Adapter	10-8 F5OLO-S
19.	Adapter	10 V6LO-S
20.	Cable Ties ^a	200-0467-01

- a. The colored cable ties included in the kit are used to identify the hydraulic hoses. Place identical colored cable ties at the ends of each hydraulic hose to positively identify the hose.

Note: The suggested hose color assignments are as follows:

Pressure - Red

Return - Green

LS Orbitrol - Blue

LS Out - Grey

Steer Right - Yellow

Steer Left - Orange

Bracket Kit Components

Figure 1-4 Bracket Kit Components (PN: 152-0033-01)

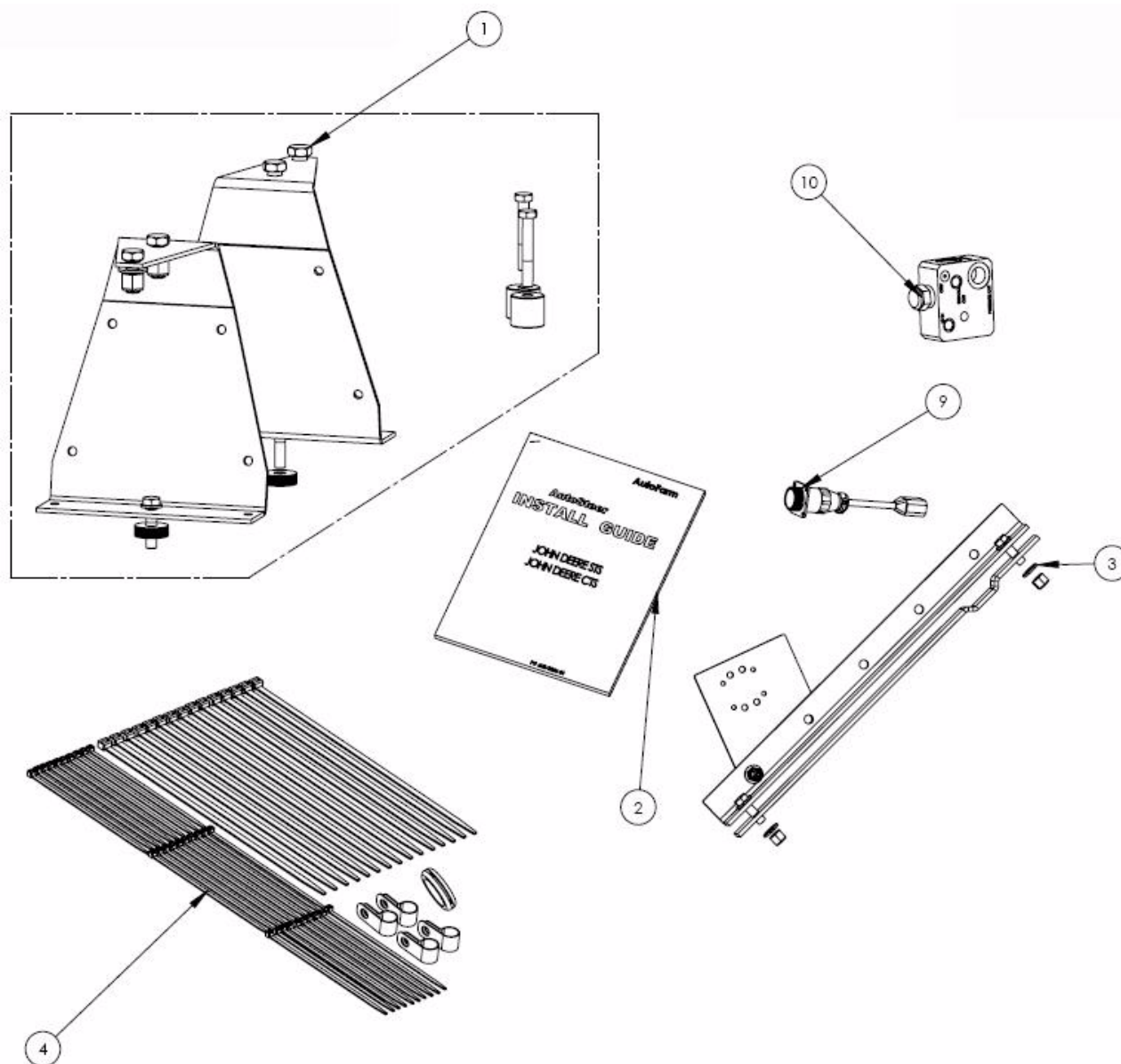


Table 1-5 Bracket Kit Components (PN: 152-0033-01)

Item	Component	Part Number
1.	Roof Module Brackets	200-0156-01
2.	Installation Guide	602-0236-01
3.	Display Bracket	200-0137-03

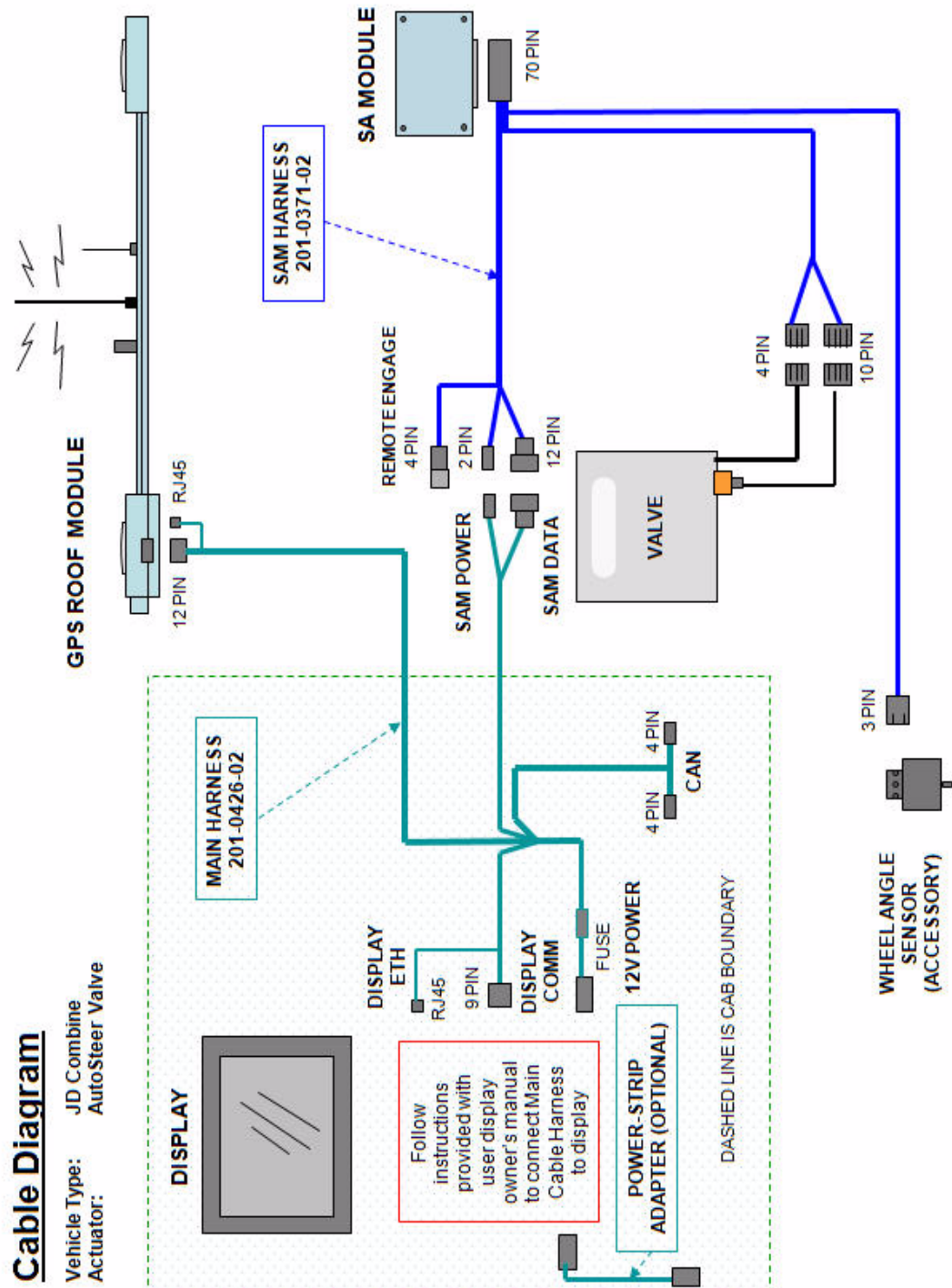
Item	Component	Part Number
4.	Cable Routing Hardware	200-0174-01
8.	Termination Kit	200-0481-01
9.	Power Adapter Cable	201-0368-01
10.	LS Priority Valve	500-0340-01

Installation Procedure Outline

Note: The system interconnect cable diagram in the *Cable Diagram* on page 9 section of this chapter shows the A5 AutoSteer electrical connections.

1. Verify shipped components.
2. Install the Hydraulic Valve Assembly.
3. Install the Hydraulic Hoses.
4. Install the Wheel Angle Sensor.
5. Install the SA Module.
6. Install the Roof Module.
7. Install the Display.
8. Install the Main Cable Harness and the SA Module Harness.
9. Ensure all connectors are properly coupled.
10. Power ON the AutoSteer system.
11. Calibrate the vehicle.
12. Tune the vehicle.
13. Verify the installation and system operation.

Cable Diagram




Steering Valve Installation

This **Steering Valve Installation** chapter contains information in the following sections:

- *Steering Valve Installation Procedure Overview*
- *AutoSteer Valve Configuration*
- *AutoSteer Valve Configuration*
- *LS Priority Valve Installation*
 - *Identifying Orbitrol Ports*
 - *Replacing the Priority Valve Damper Orifice*
- *Install the Valve Bracket*
 - *Alternative Bracket Mounting Location*
- *Hydraulic Hose Connection Overview*
- *Hose Connection Diagram*
- *AutoSteer Valve Installation Checklist*

Steering Valve Installation Procedure Overview

1. Install an internal plug to configure the AutoSteer valve for Open Center Steering installation.
2. Install the AutoSteer valve bracket and valve on the vehicle.
3. Connect the LS Priority valve to the Orbitrol pressure port.
4. Connect the hoses between the AutoSteer valve and the vehicle.
5. Check for oil leaks.
6. Adjust the AutoSteer pressure relief valve.
7. Perform a functional test to confirm correct valve operation.

	⚠ WARNING
	<p style="text-align: center;">High-Pressure Fluid Hazard</p> <p>Read this manual before installation. Wear hand and eye protection while performing hydraulic system maintenance. Relieve hydraulic system pressure before servicing the hydraulic system.</p>

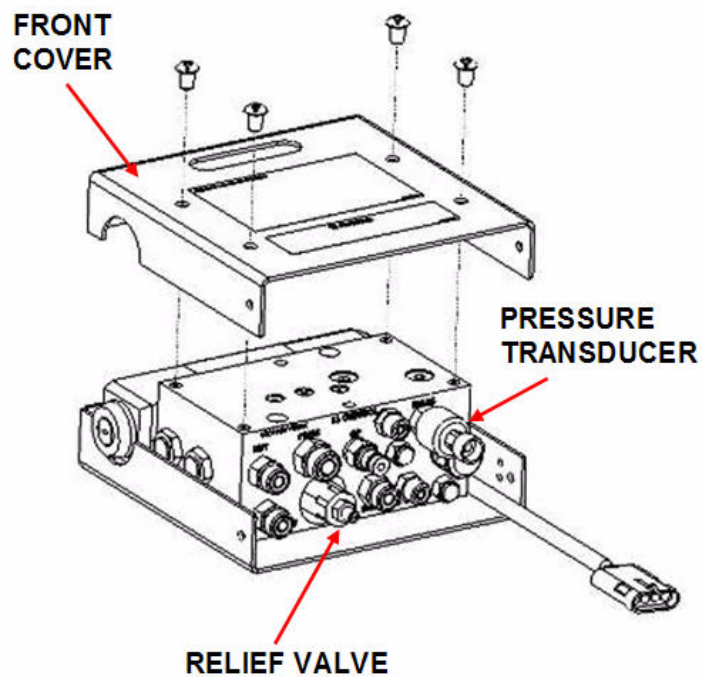
AutoSteer Valve Configuration

Replace plug **13A** in the AutoSteer valve with a 0.022" orifice to configure the valve for Open Center Steering operation. Follow the procedure shown below.

Note: The AutoSteer valve will not operate correctly if you do not install the orifice.

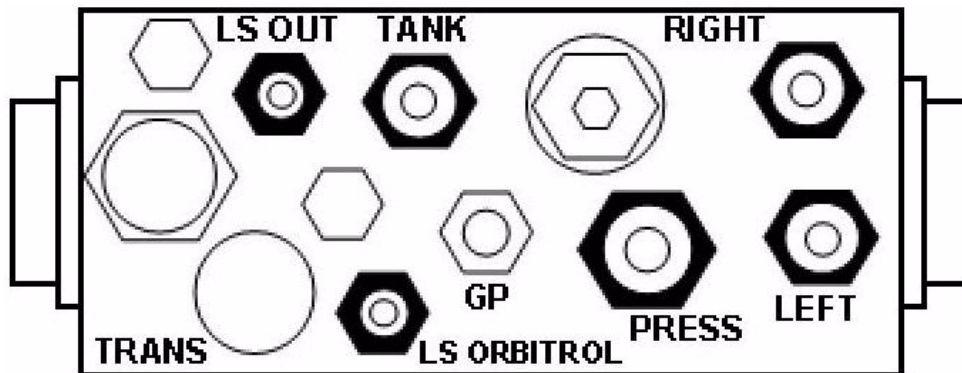
1. Use a 3/16" Allen key to remove the four cover screws. See *Figure 2-1*.
2. Remove the front cover to access the hose connections, pressure transducer and relief valve. See *Figure 2-1*.

Figure 2-1 Steering Valve Assembly



Note: *Figure 2-2* shows the Steering Valve assembly hydraulic connection functions.

Figure 2-2 AutoSteer Valve Port Identification



Note: The ports shown in *Figure 2-2* are upside-down relative to the ports shown in *Figure 2-1*.

Table 2-1 Valve Functions and Fitting Sizes

Hose Adapter	Fitting Type/Size
PRESS = PUMP PRESSURE	-8 ORFS
TANK = TANK / RETURN	-6 ORFS
LS ORBITROL = LS FROM ORBITROL	-4 ORFS
LS OUT = LS	-4 ORFS
LEFT = LEFT STEERING CYLINDER	-6 ORFS
RIGHT = RIGHT STEERING CYLINDER	-6 ORFS
GP = DIAGNOSTICS PORT	1/8"
TRANS = PRESSURE TRANSDUCER	-4 SAE ORB.

3. Identify the threaded plug shipped with the valve in a parking position identified as **PLUG** on the front face. See *Figure 2-3*.

Note: The plug does not have a hole and must not be mistaken with the two orifices which are also shipped next to the plug on the valve. See *Figure 2-3*.

Figure 2-3 Steering Valve With Cover Removed

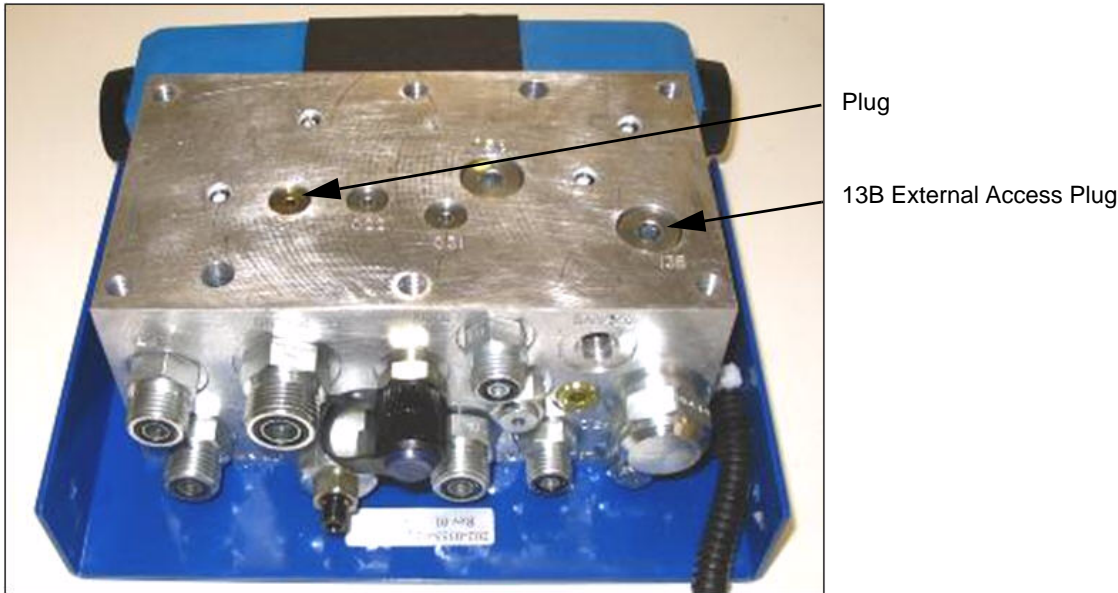
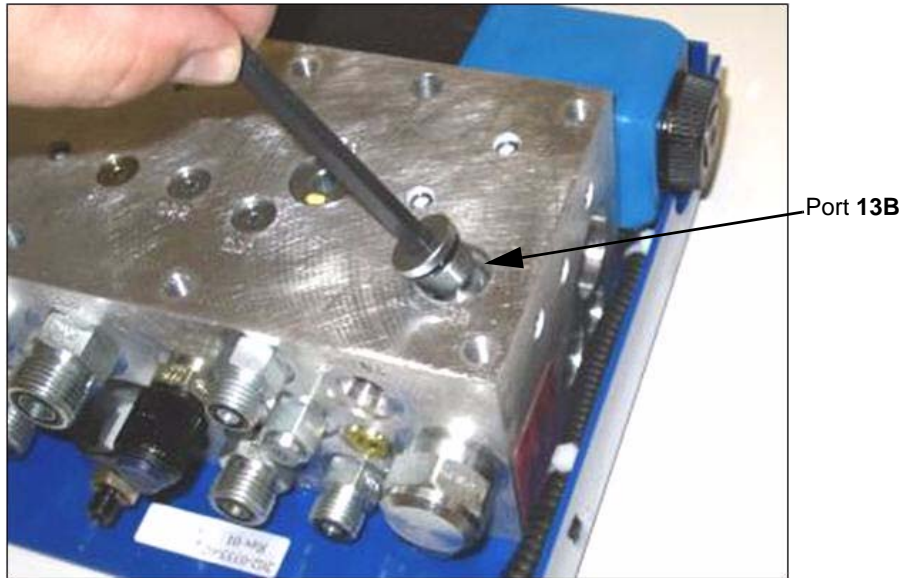


Table 2-2 Plug and Orifice Configuration Summary

Type of Installation	13A	13B	13C
Factory Default Configuration	Plug	Open	Plug
Open Center Orbitrol Using Priority Valve	0.022 Orifice	Plug	Plug

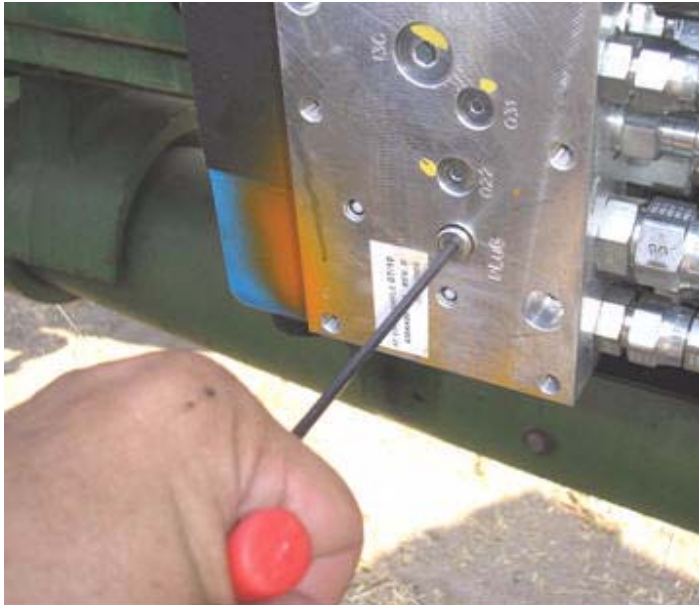
4. Identify the large external access plug identified in position **13B**.
5. Remove the external plug in position **13B** using a 1/4" hex key. See *Figure 2-4*.

Figure 2-4 Removing External Plug



6. Remove the small plug from position **PLUG** using a 1/8" hex key. See *Figure 2-5*.

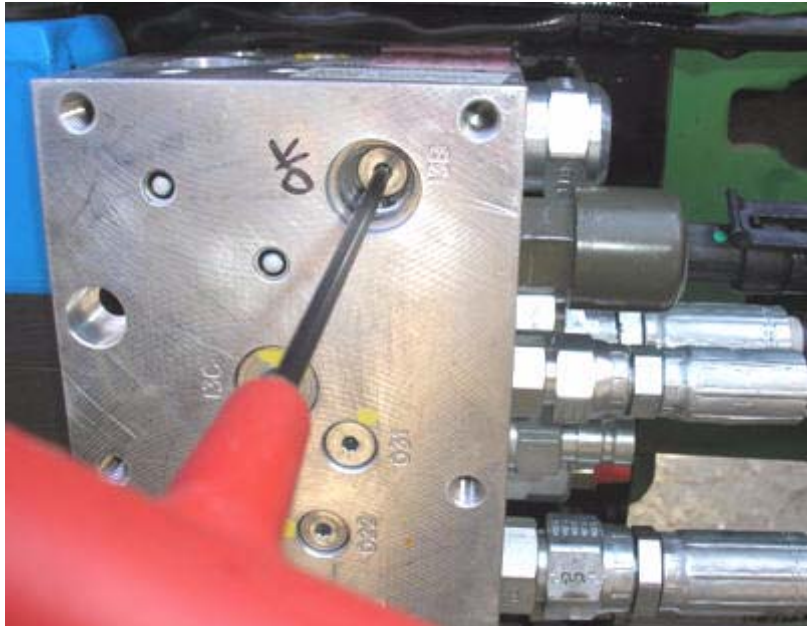
Figure 2-5 Remove Plug



7. Install the small plug inside the hole in position **13B**. The plug engages an existing thread about 1 inch below the surface. See *Figure 2-6*.

Note: Do not over tighten the plug.

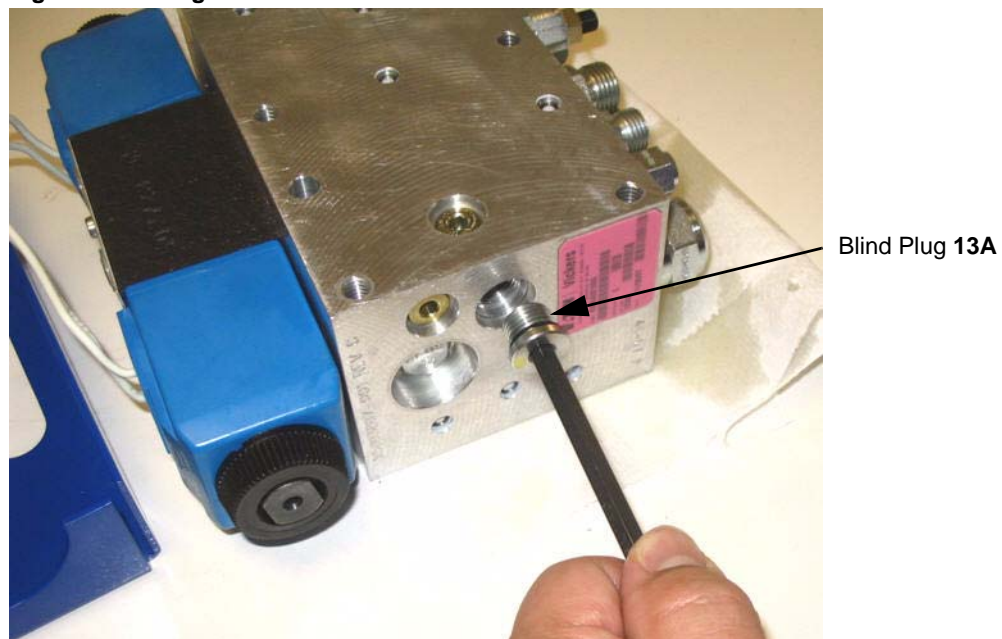
Figure 2-6 Installing Plug In 13B Position



8. Re-install the large external plug in position **13B**.
9. Remove the large external plug identified as **13A** on the valve right side using a 1/4" Allen key.

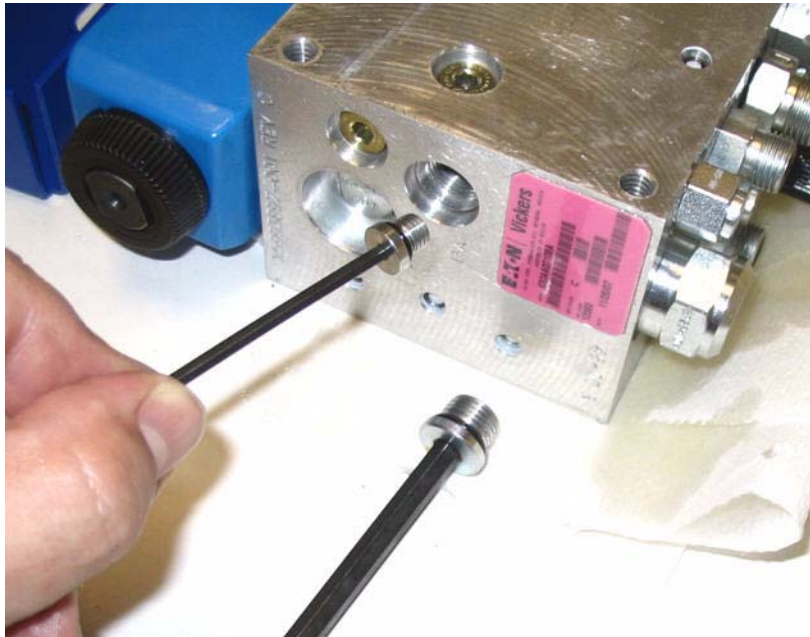
Note: Plug **13A** is located on the side of the compact valve. See *Figure 2-7*.

Figure 2-7 Plug 13A Location



10. Remove the small internal plug in position **13A** using a 1/8" Allen key. See *Figure 2-8*.

Figure 2-8 Internal Plug Removal



11. Replace the small internal blind plug in position **13A** with a 0.022" diameter orifice removed from the front of the valve.

Note: The orifice enables Load Sense bleed-down to reduce pump pressure.

12. Thread the orifice into the bottom of cavity **13A** and tighten.

13. Replace the large external plug in position **13A**.

Note: The small blind plug that was removed from position **13A** can be threaded into the front of the valve for storage and future use.

Note: A check valve must be installed on the AutoSteer Return port for improved manual steering and kick-out. A Parker check valve is provided as a loose part in the STS hose kit. Install the check valve before installing the AutoSteer valve on the machine. Use a work bench or table to work on the valve.

14. Remove the -6 ORFS hose adapter from the port identified as TANK. See *Figure 2-9*.

Note: You may have to remove adjacent adapters or the rear valve cover for better access to the Return/Tank port.

Figure 2-9 Tank/Return Port Location



15. Install the threaded check valve provided in your hose kit.

Note: The check valve looks just like a normal hose adapter but has an internal spring.

16. Tighten the check valve and replace any parts removed for ease of access.

Note: The AutoSteer valve uses a Load Sense relief valve to limit the maximum pump pressure by limiting the maximum Load Sense pressure output. The relief valve will only limit the maximum pump pressure while AutoSteering. The maximum manual steering pressure is set by a separate relief valve inside the vehicle Orbitrol.

17. Loosen the jam nut on the relief valve using a 1/2" combination wrench. See *Figure 2-10*.

Figure 2-10 Adjusting the Relief Valve



Note: The AutoSteer relief valve is set at the factory to 3000psi and can be adjusted in the field between zero and 3600psi.

18. Loosen the set screw (to reduce the relief pressure) by turning it two complete turns with a 5/32" Allen key in the counter-clockwise direction.
19. Leave the jam nut loose because further adjustments of the relief valve are required after the installation is completed.
20. This concludes the valve configuration. The valve is now ready for vehicle installation.

LS Priority Valve Installation

An Open Center Orbitrol usually has only four hoses (pressure, return, right, left) and does not have a load sense hose. A Load Sense Priority Valve is required to complete the AutoSteer hydraulic installation on Open Center Orbitrols. The AutoSteer LS priority valve provides oil pressure on demand to the AutoSteer valve.

The parts shown below are provided with the AutoSteer installation kit for Open Center steering systems. *Figure 2-11* shows the priority valve and *Figure 2-12* shows the priority valve in-line mounting installation.

Note: Ensure the LS Priority Valve is properly oriented and all hose connections are correct and tight before starting the engine. Inverting the **PUMP IN** and **ORBITROL** ports on the LS Priority Valve causes immediate pump damage when the engine is started because the priority valve only allows oil flow in one direction.

Figure 2-11 AutoSteer Priority Valve (PN: 500-0340-01)

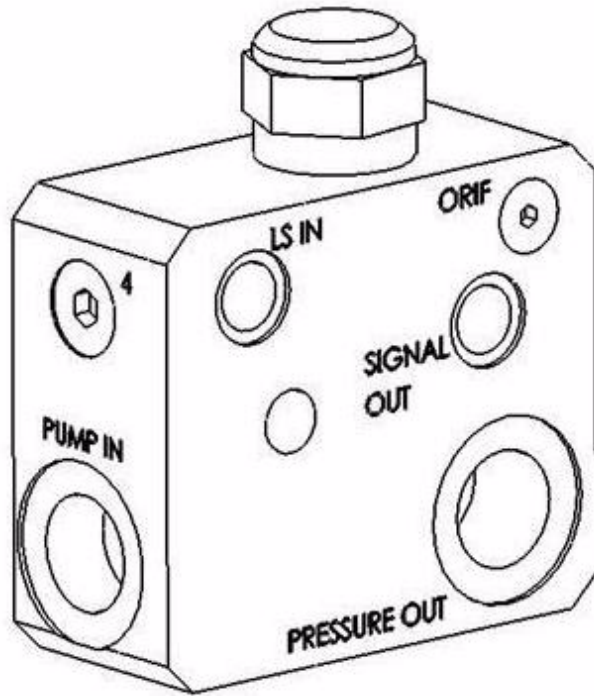


Figure 2-12 Priority Valve Mounted In-Line

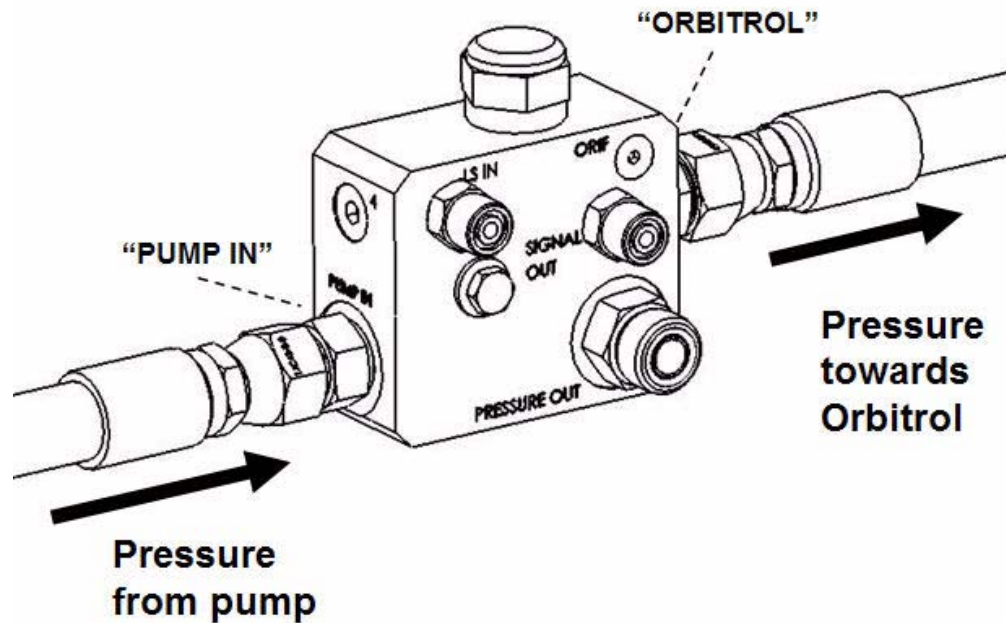
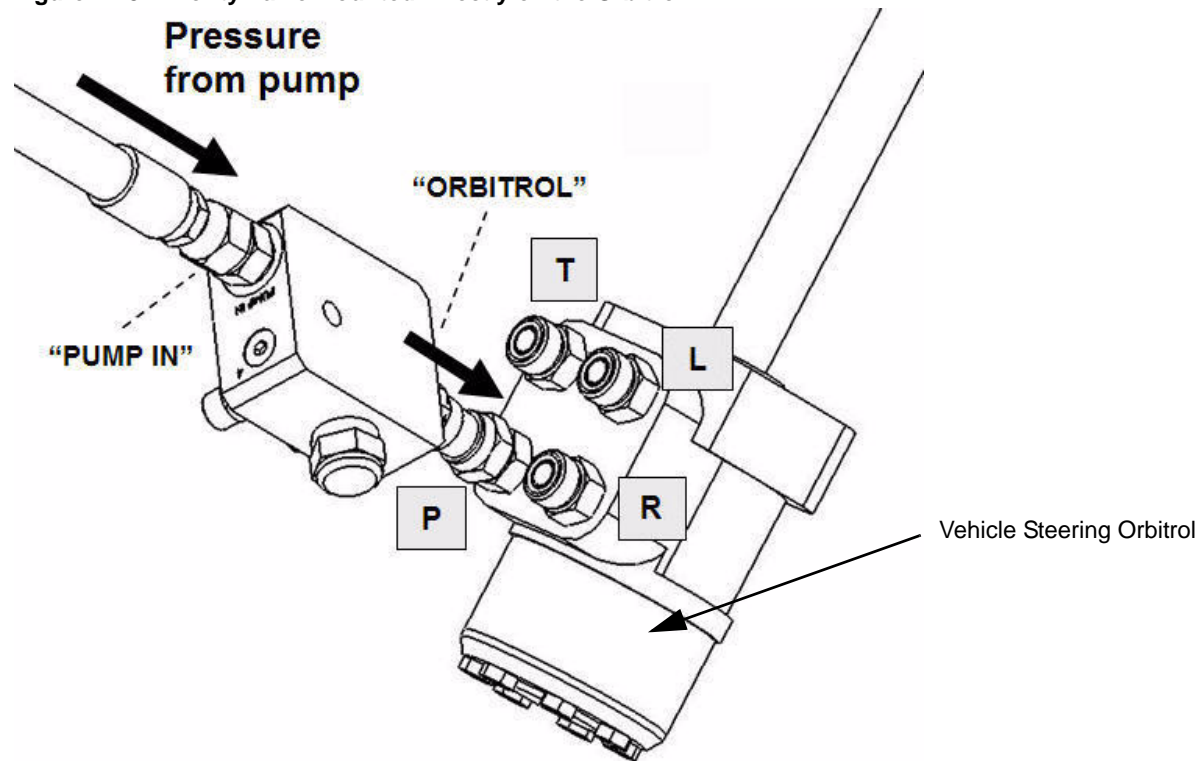


Figure 2-13 shows the LS priority valve installed directly on the Orbitrol pressure port. This type of installation is preferred when there is sufficient clearance in front of the Orbitrol. The threaded adapters provided with your adapter kit enable this type of installation.

Note: The hose adapter type and size must match the vehicle's hose fittings.

Figure 2-13 Priority Valve Mounted Directly on the Orbitrol

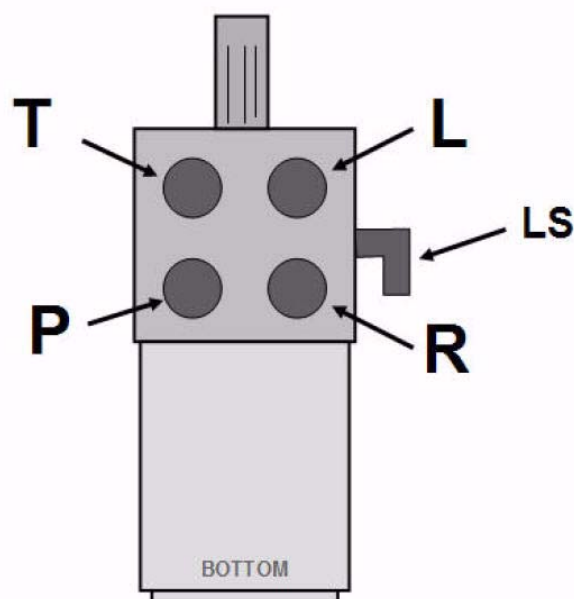


Identifying Orbitrol Ports

The ports on the Orbitrol under the cab front must be clearly identified before you start to connect hoses. Use *Figure 2-14* through *Figure 2-16* to positively identify all Orbitrol ports.

Note: To avoid pump damage caused by wrong hose connections, the Pressure and Return ports on the Orbitrol must be positively identified. Before connecting hoses, confirm that the Pressure and Return ports on your machine are as shown on this page. The Pressure port can be positively identified by following the hose that leads to the gear pump in the engine bay or the attenuator. The Return port can be positively identified by following the hose that leads to the return oil filter or oil reservoir, depending on the machine model. The Pressure hose fitting on this machine is usually larger than the Return hose fitting.

Figure 2-14 Orbitrol Port Identification



T = Return/Tank

L = Left

P = Pressure

LS = Load Sense (Load Sense is not used on this machine)

R = Right

Figure 2-15 Orbitrol Ports (view 1)

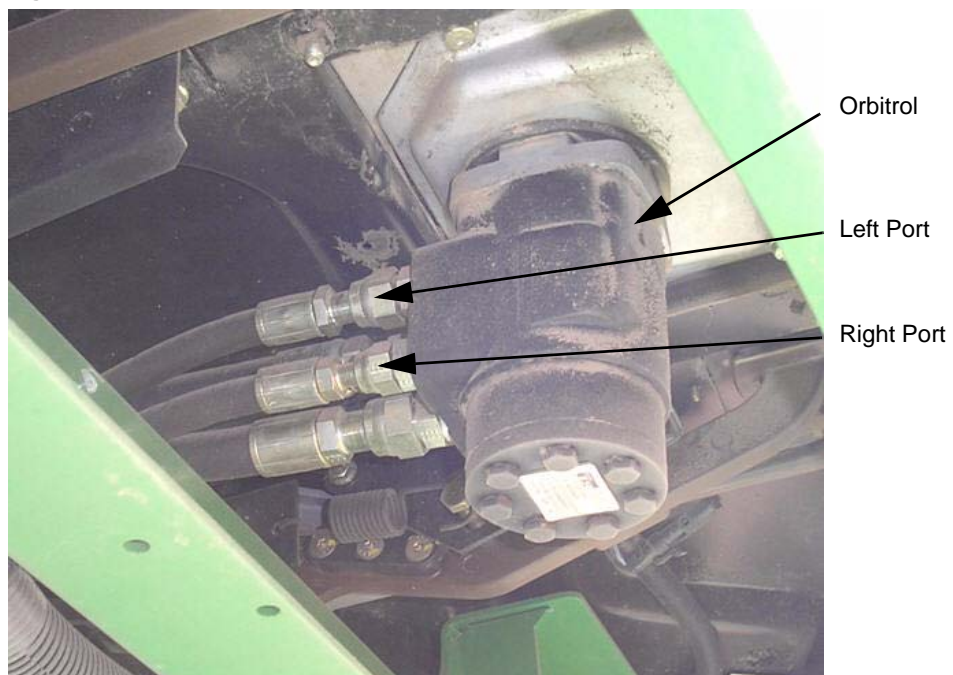


Figure 2-16 Orbitrol Ports (view 2)



Replacing the Priority Valve Damper Orifice

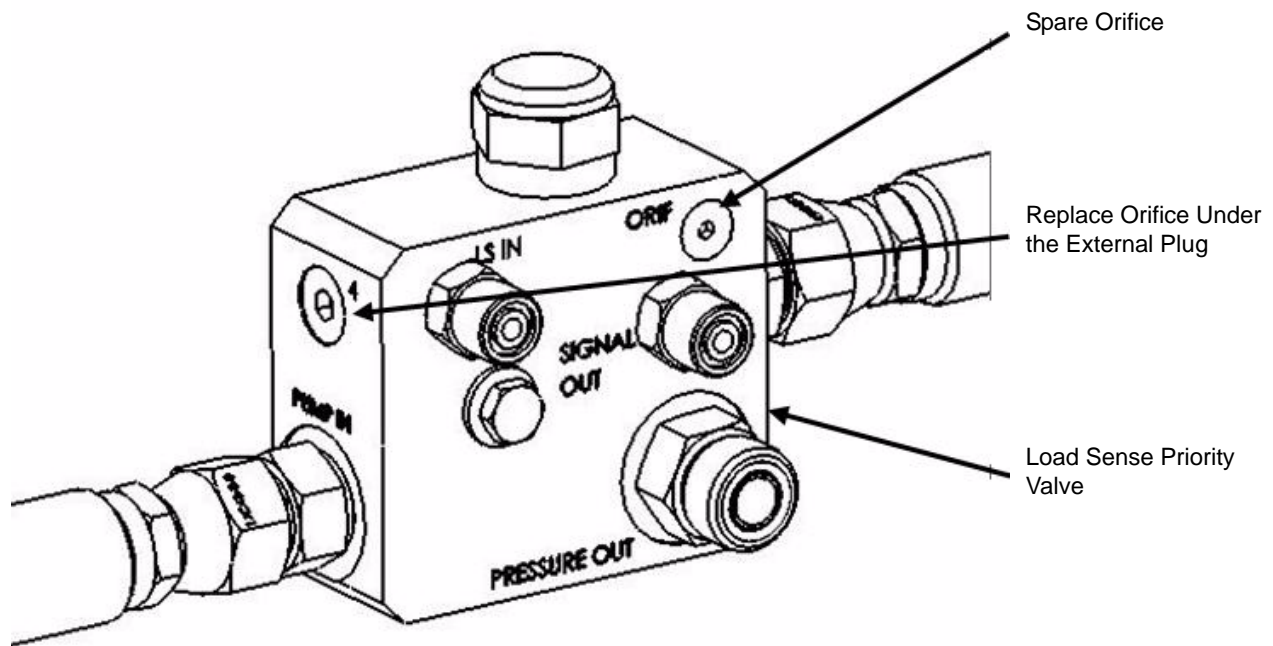
A smaller damper orifice is provided attached to the LS priority valve and may be used to replace the factory installed orifice if you experience chatter (hydraulic noise) when AutoSteering. *Figure 2-17* shows the priority valve damper orifice location.

Follow this procedure to replace the damper orifice:

1. Remove the external plug at position **4** using a 3/16" hex key.
2. Remove the existing internal orifice at **4** using a 1/8" hex key.
3. Remove the spare orifice at ORIF using a 1/8" hex key and then install it at **4**.
4. Replace the external plug at **4** and tighten.
5. Store the removed orifice at the parking position ORIF.

Note: Always clean the orifice and confirm the hole is not blocked before installing it in the valve.

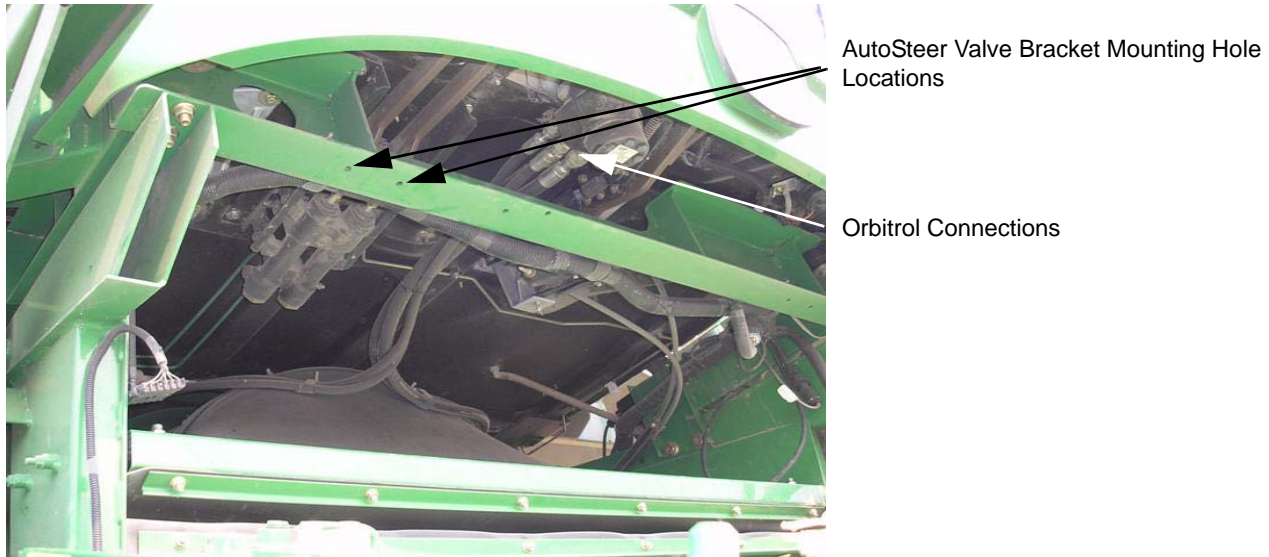
Figure 2-17 Damper Orifice Location



Install the Valve Bracket

The AutoSteer valve should be installed under the cab in the position shown using the valve bracket and mounting bolts provided in the bracket kit. See *Figure 2-18*. An **L** valve bracket is used to secure the valve to the vehicle using bolts provided in the kit. Hoses are connected to the steering lines and Orbitrol ports.

Figure 2-18 AutoSteer Valve Bracket Mounting Location



Install the Valve Bracket

1. Install the **L** valve bracket in the position shown in *Figure 2-19* and secure using two bolts provided in the bracket kit.

Note: The valve position must enable the hoses to reach the steering unit (Orbitrol). Secure the valve bracket to the frame using one of the two valve brackets and the supplied hardware. If possible, use existing holes in the frame to secure the valve bracket.

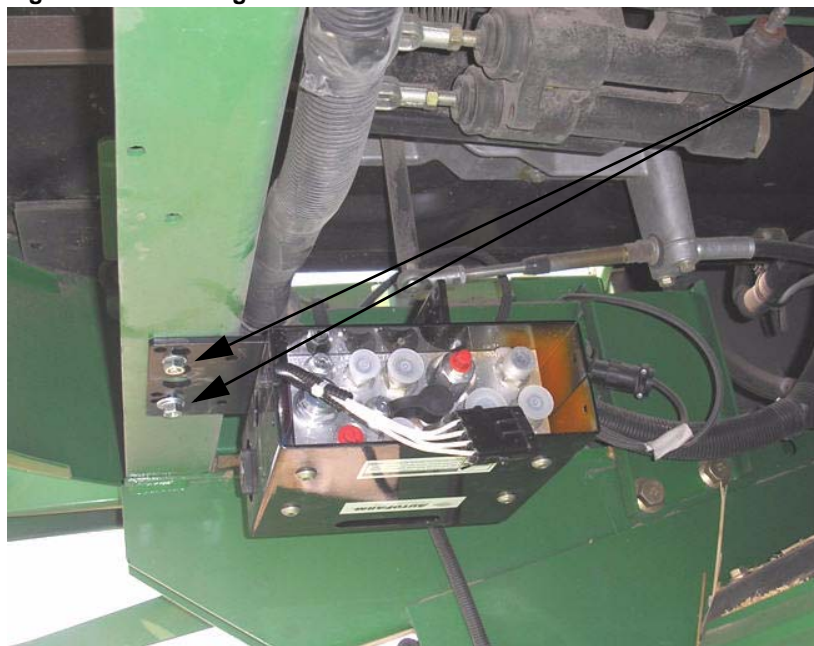
2. Secure the valve to the bracket using four 5/16" hex screws provided with the kit.

Note: Alternatively, you may secure the valve to the bracket using two long 5/16" Allen screws provided with the kit.

3. Remove the front valve cover using a 3/16" Allen key to loosen the four screws.

Note: The valve front cover must be removed to provide access to hose connections.

Figure 2-19 Steering Valve Mounted on Bracket



Mounting Bolts

Alternative Bracket Mounting Location

The AutoSteer valve may be installed in alternative mounting positions depending on the exact machine model and available mounting holes or bolts. *Figure 2-20* shows a possible alternative steering valve location.

Figure 2-20 Alternative Steering Valve Location



Hydraulic Hose Connection Overview

1. Refer to *Figure 2-21* for a detailed hose diagram and follow the instructions below.
2. Disconnect the pressure hose from the Orbitrol and connect it to the LS Priority Valve **PUMP IN** port.

Note: Use an extender hose or thread adapter as required to complete this hose connection.

3. Connect a hose from the LS Priority Valve **PRESSURE OUT** port to the AutoSteer valve **PRESS** port.
4. Connect a hose from the AutoSteer valve **LS Orbitrol** port to the LS Priority Valve **SIGNAL OUT** port.
5. Install a 65psi check valve on the AutoSteer valve **Return** port.

Note: The check valve should have previously been completed during valve configuration.

6. Install a tee adapter on the Orbitrol **Return** port. You can install this tee anywhere along the Return hose between the Orbitrol and the Return.
7. Connect a hose between the **check valve** installed on the AutoSteer valve **Return** port to the Orbitrol **Return** line installed Tee adapter.
8. Connect a hose between the AutoSteer valve **LS Out** port and the LS Priority Valve **LS IN** port.
9. Connect a threaded adapter from the LS Priority Valve **ORBITROL** port to the Orbitrol Pressure port.
10. Connect a hose between the AutoSteer valve **Left** port and the Orbitrol **left** steering hose.

Note: You may install the tee adapter anywhere along the left steering line in a convenient location. See *Figure 2-24*.

11. Connect a hose between the AutoSteer valve **Right** port and the Orbitrol **right** steering hose.

Note: You may install the tee adapter anywhere along the right steering line in a convenient location. See *Figure 2-24*.

12. Install the pressure transducer in the TRANS port. Do not overtighten.
13. Individually check each hose connection at both ends and confirm that it matches the hose diagram in *Figure 2-21*.

Note: Wrong hose connections can cause immediate pump damage when the engine is started.

14. Confirm that the AutoSteer valve is configured internally for an Open Center installation with the correct orifices and/or plugs installed.
15. Check for leaks and adjust the relief valve after the engine is started.
16. Secure all hoses in a position that is protected and does not interfere with the vehicle operation and service.

Note: Keep all hoses away from moving parts or removable access panels.

17. Proceed to the calibration and tuning process.

Hose Connection Diagram

Figure 2-21 Open Center Steering System Hydraulic Connections

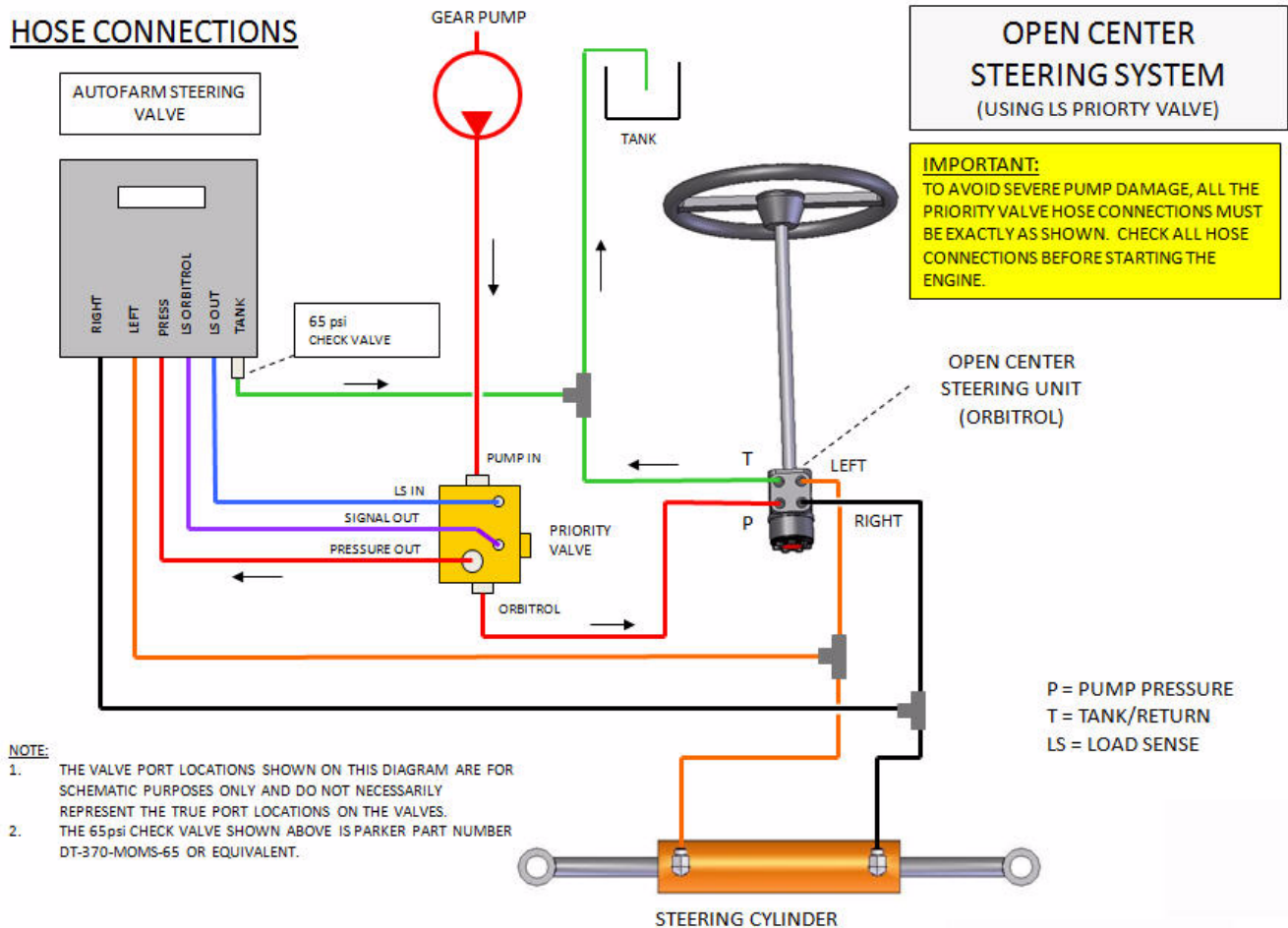


Figure 2-22 Orbitrol to Priority Valve Connection

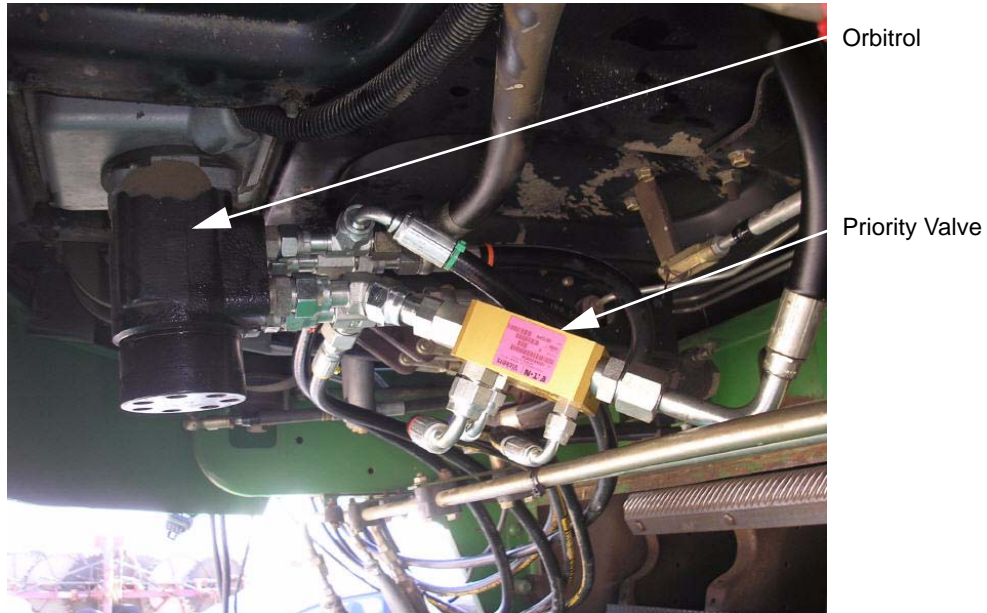
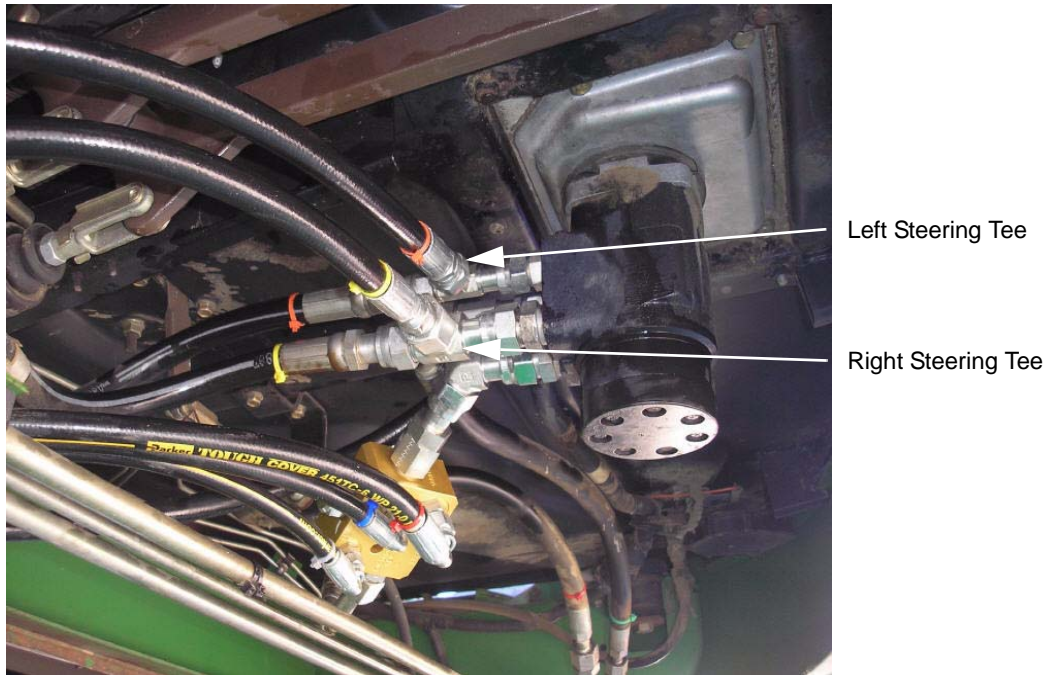


Figure 2-23 Left Steering Valve Connection on Orbitrol



Figure 2-24 Completed Left and Right Steering Orbitrol Connections



AutoSteer Valve Installation Checklist

1. Configure the AutoSteer valve with correct plugs and orifice. ☐
2. Ensure the valve bracket bolts are tight. ☐
3. Ensure mounting screws securing the AutoSteer valve are tight. ☐
4. Ensure the Pump pressure hose is connected to the correct Priority valve port. ☐
5. Ensure the Return hose is connected to correct AutoSteer valve and Orbitrol ports. ☐
6. Ensure the LS-OUT hose connected to correct AutoSteer valve and Priority valve ports. ☐
7. Ensure the LS ORBITROL (LS IN) hose is connected to the correct ports at both ends. ☐
8. Ensure the Right Steer hose is connected correctly at both ends. ☐
9. Ensure the Left Steer hose is connected correctly at both ends. ☐
10. Ensure the Pressure Transducer is installed and tight. ☐
11. Ensure all hose fittings are connected and tight. ☐
12. Check hose routing and ensure hoses are secured with cable ties. ☐
13. Ensure the SA Module Harness is connected to both valve connectors. ☐
14. Ensure the valve test port has the 5000psi pressure gauge installed. ☐
15. Ensure the AutoSteer valve Return port Check Valve was installed. ☐
16. Ensure the hoses do not interfere with vehicle operation. ☐

Wheel Angle Sensor (WAS) Installation

This **Wheel Angle Sensor Installation** chapter information is provided in the following sections:

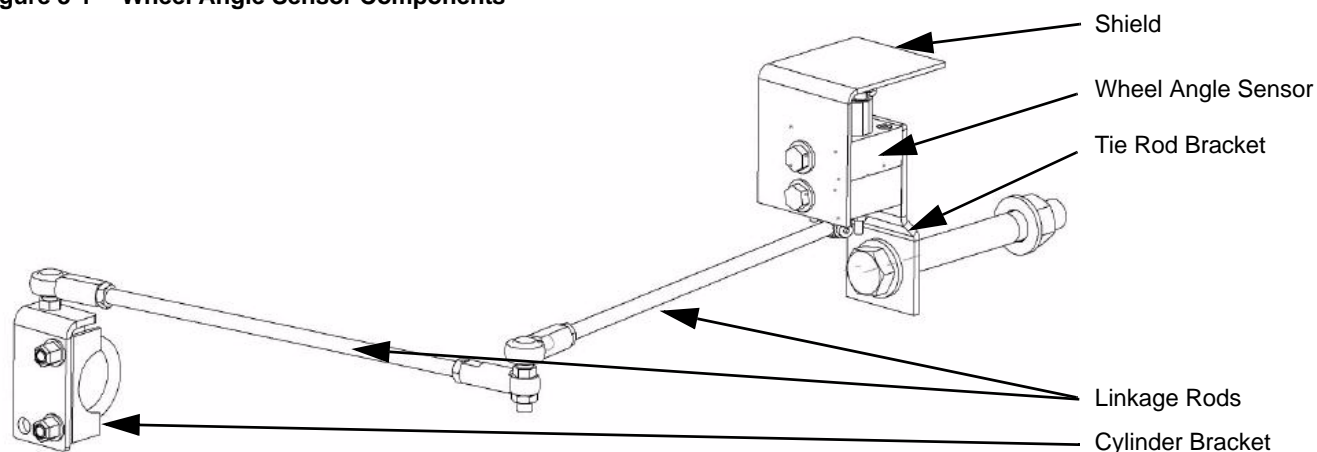
- *9000 STS Wheel Angle Sensor Installation Procedure*
 - *Mounting Wheel Angle Sensor Hardware*
 - *Cutting Linkage Rods to Length*
 - *Assembling Linkage Rod Hardware*
 - *Attaching and Adjusting Wheel Angle Sensor Linkage Rods*
- *9000 CTS Wheel Angle Sensor Installation Procedure*
 - *Mounting Wheel Angle Sensor Hardware*
 - *Cutting Linkage Rods to Length*
 - *Assembling Linkage Rod Hardware*
 - *Attaching and Adjusting Wheel Angle Sensor Linkage Rods*

Note: The Wheel Angle Sensor is optional equipment and is not provided with the installation kit. The Wheel Angle Sensor installation instructions are provided for special installations, when required.

9000 STS Wheel Angle Sensor Installation Procedure

Figure 3-1 shows the 9000 STS Non-AT Ready combine Wheel Angle Sensor assembly fully assembled.

Figure 3-1 Wheel Angle Sensor Components



Mounting Wheel Angle Sensor Hardware

1. Find the Wheel Angle Sensor bracket mounting location.

Note: The bracket should be located on the vehicle's rear axle left side. See *Figure 3-2*.

Figure 3-2 Wheel Angle Sensor Bracket Location



Mounting Location

2. Mount the Wheel Angle Sensor bracket. See *Figure 3-3*.
3. Secure with a bolt provided in your kit.

Figure 3-3 Wheel Angle Sensor Bracket Mounted



Wheel Angle Sensor Bracket Mounted

4. Install the Wheel Angle Sensor on the bracket as shown in *Figure 3-4*.

Figure 3-4 Wheel Angle Sensor Mounted (shown with linkage rods attached)



Wheel Angle Sensor Mounted

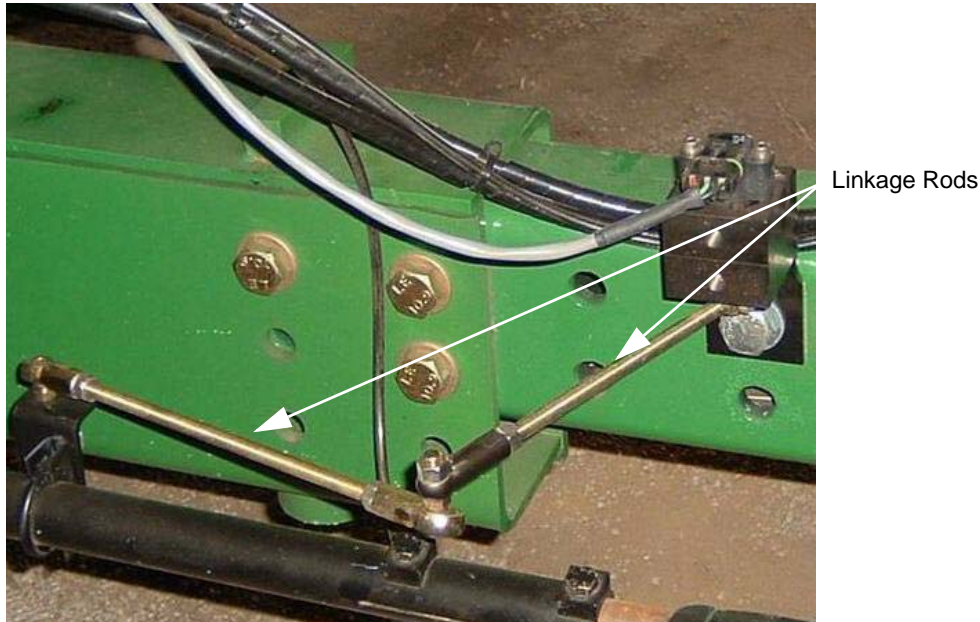
5. Install the linkage rod **L** bracket on the tie rod using a muffler clamp. See *Figure 3-5*.

Figure 3-5 Linkage Rod **L** Bracket



Note: The threaded linkage rods must be cut to the correct lengths before final assembly. The linkage rods are shown assembled in *Figure 3-6*. See *Table 3-1* and *Table 3-2* for the cut and assembled linkage rod lengths.

Figure 3-6 Wheel Angle Sensor Assembly Completely Assembled



Cutting Linkage Rods to Length

1. Measure and mark the two rods for cutting, according to the length shown in *Table 3-1*.

Note: Before cutting the linkage rods, verify the Wheel Angle Sensor brackets will attach to the vehicle as shown in this manual and they are attached the correct distance from any reference points shown. If this is not possible, do not cut the rods until it is determined if these lengths work for your installation. Due to possible variations in the mounting positions, these measurements could be different. These measurements are provided as a reference only. The installer is responsible for ensuring the rods are cut to the proper length.

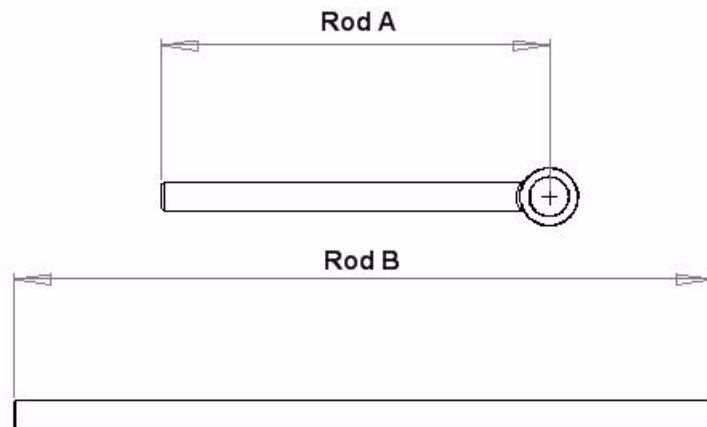
Table 3-1 Linkage Rod Cut Lengths

Item	Length
Rod A	5.7 inches (145 mm) ^a
Rod B	11.4 inches (290 mm) ^a

- a. This measurement is the rod length prior to assembly with the ball joints.

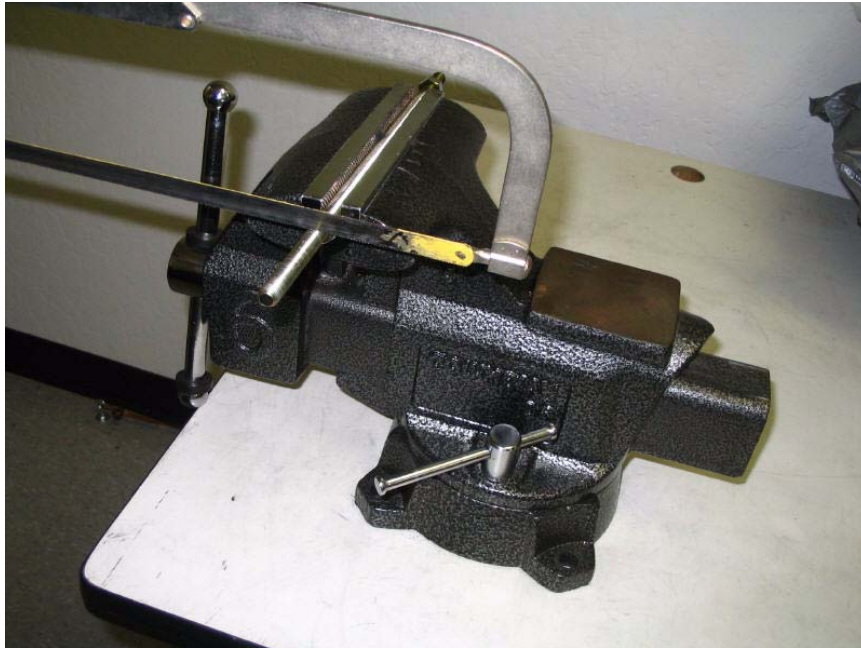
Note: *Figure 3-7* shows the measurement points used to properly cut the linkage rods.

Figure 3-7 Linkage Rod Cut Length Measurement Points



2. Use a hack saw to cut the linkage rod to length while it is held in a bench vise. See *Figure 3-8*.

Figure 3-8 Linkage Rod Cutting



Assembling Linkage Rod Hardware

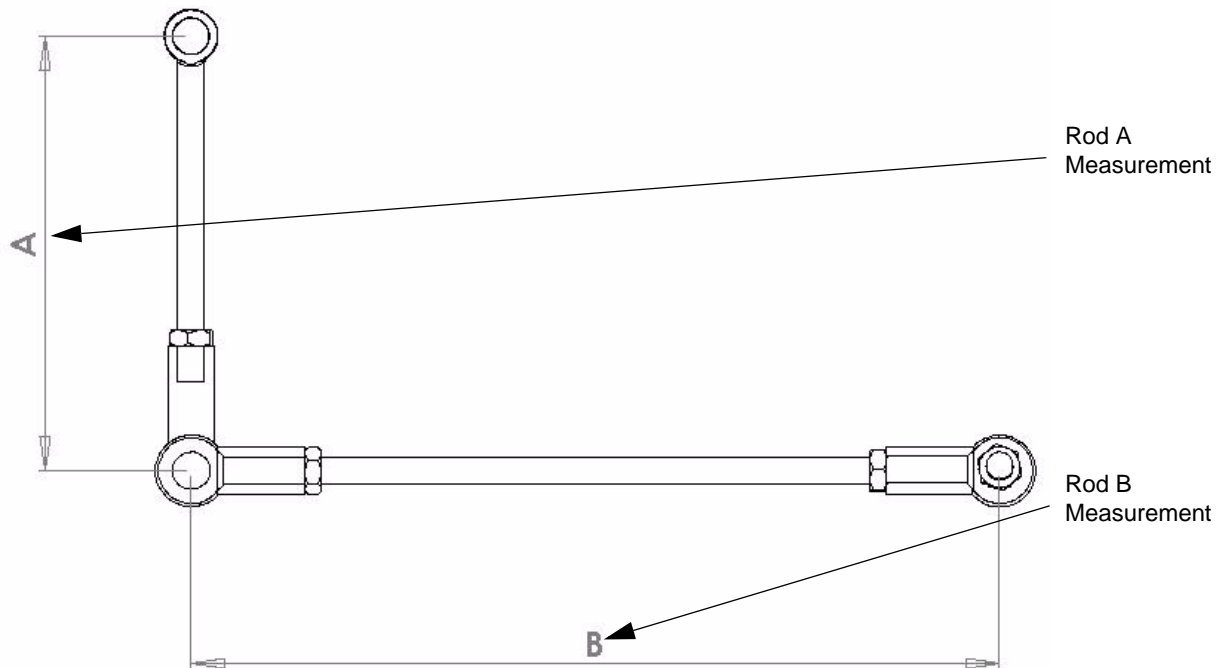
Note: The after-assembly center-to-center lengths of each linkage rod are shown in *Table 3-2*. *Figure 3-9* shows the measurement points for the assembled linkage rods.

Table 3-2 Assembled Linkage Rod Length

Item	Length
Rod A	6.7 inches (170 mm) ^a
Rod B	13.4 inches (340 mm) ^a

a. This measurement is the rod length after assembly with the ball joints.

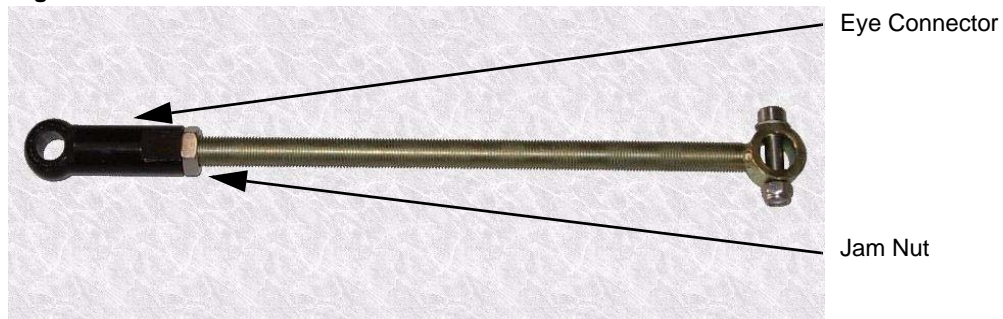
Figure 3-9 Linkage Rod (Assembled) Measurement Points



Note: The threaded rods must be cut to the correct lengths before final assembly.

1. Attach a jam nut to the Rod A end. See *Figure 3-10*.
2. Connect the eye connector to the Wheel Angle Sensor rod end. As shown in *Figure 3-10*.

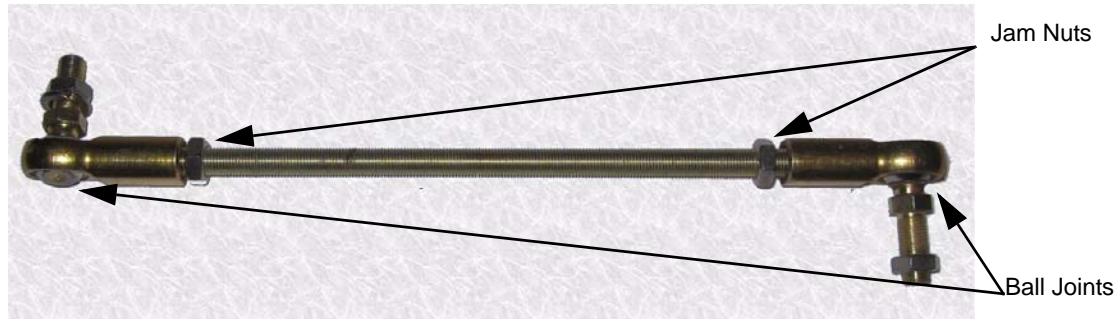
Figure 3-10 Rod A Assembled



3. Attach the jam nuts to each end of linkage Rod **B**
4. Attach the ball joints to both ends of the linkage arm as shown in *Figure 3-11*.

Note: This installation requires the bolts for the ball joints should be facing the opposite direction as shown in *Figure 3-11*.

Figure 3-11 Linkage Rod Assembled

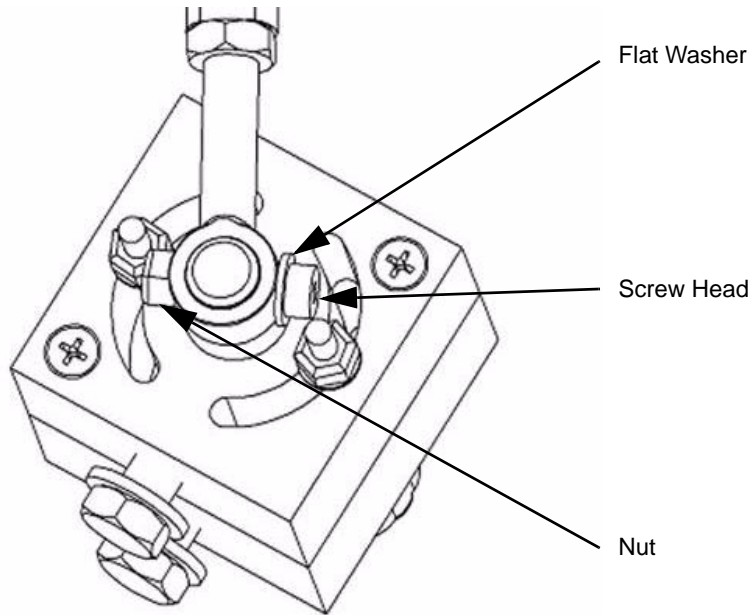


Attaching and Adjusting Wheel Angle Sensor Linkage Rods

1. Install the short linkage arm on the Wheel Angle Sensor shaft.
2. Ensure a flat washer is placed under the screw head when attaching the linkage rod to the sensor shaft. See *Figure 3-12*.

Note: The washer should be on the bolt head side and not the assembly nut side.

Figure 3-12 Washer on Shaft Screw




Note: Do not turn the wheels or drive the combine before the Wheel Angle Sensor has been adjusted using the AutoSteer Calibration screens. The potentiometer can only rotate a maximum of 180 degrees and if it is rotated beyond its mechanical stops, it will be permanently damaged.

3. Install the long threaded linkage on the tie rod bracket using a ball joint.
4. With the linkage rods disconnected, turn the steering wheel so the wheels are centered (the vehicle will travel straight ahead when moving).
5. Temporarily attach the linkage rods.

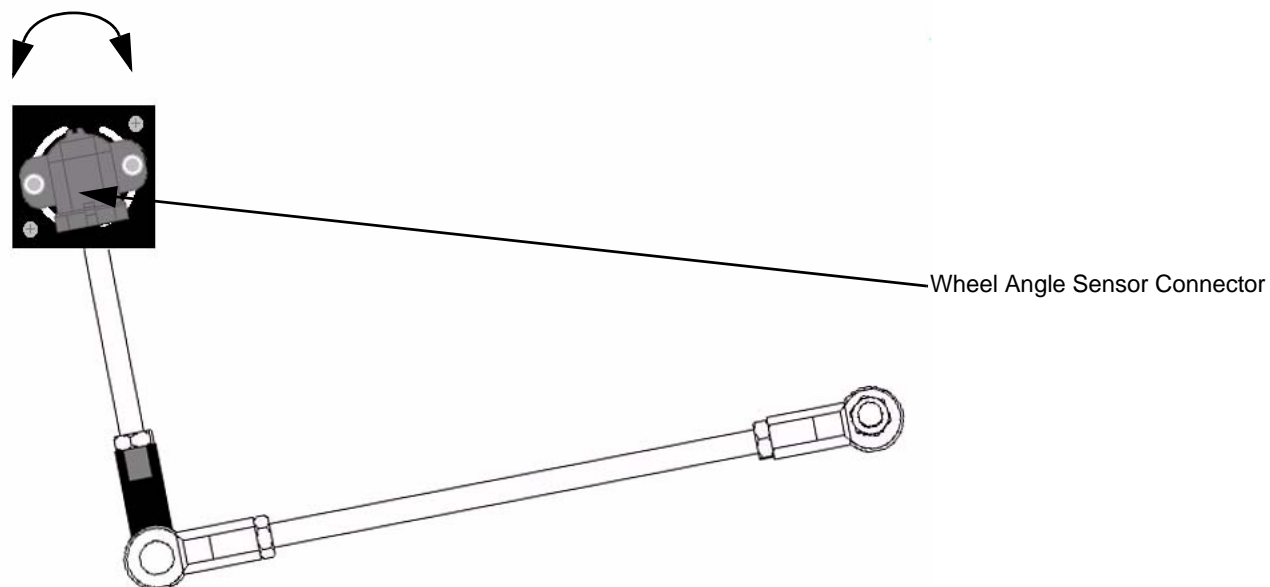
Note: Never leave the linkage rods attached to Wheel Angle Sensor rod and turn the steering wheels manually or automatically until the fit has been verified. The linkage rods must remain apart while the steering wheels are turned to the maximum right and left positions and then temporarily attached at these positions. Failure to disconnect the linkage rods may cause the Wheel Angle Sensor or vehicle to become damaged.

Note: After the linkage rods are assembled, they should move freely without touching any other parts and without overextending. Make any necessary adjustments to the linkage rods, if there is mechanical interference.

	<p style="text-align: center;">⚠ WARNING</p> <p>Always shut down the vehicle when working around the steering axle while checking and adjusting the Wheel Angle Sensor rod lengths. The steering axle could move suddenly and cause severe injury or death.</p>
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6. Rotate the Wheel Angle Sensor potentiometer on top of the mounting block so the wire connector is parallel to the Wheel Angle Sensor linkage rod. See *Figure 3-13*.

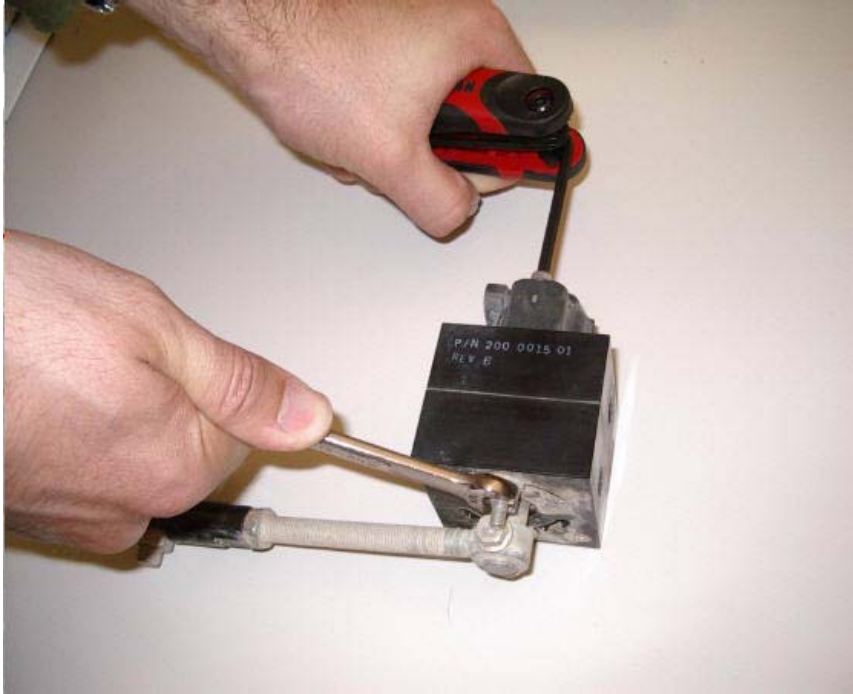
Figure 3-13 Adjusting Potentiometer Angle



7. Tighten the two screws securing the potentiometer to the Wheel Angle Sensor, after final adjustments. See *Figure 3-14*.

Note: Use a 5/32" hex key and a 3/8" wrench to secure the potentiometer. See *Figure 3-14*.

Figure 3-14 Wheel Angle Sensor Potentiometer (shown on bench)



8. Disconnect the linkage rods and turn the steering wheel manually to the full left position.

9. Reattach the linkage assembly and verify the sensor will not be damaged. See *Figure 3-15*.
10. Adjust the linkage rod lengths as necessary.

Figure 3-15 Wheels Turned Full Left



11. Disconnect the linkage rods and turn the steering wheel manually to the full right position. See *Figure 3-16*.
12. Reattach the linkage assembly and verify the sensor will not be damaged.
13. Adjust the linkage rod lengths as necessary.

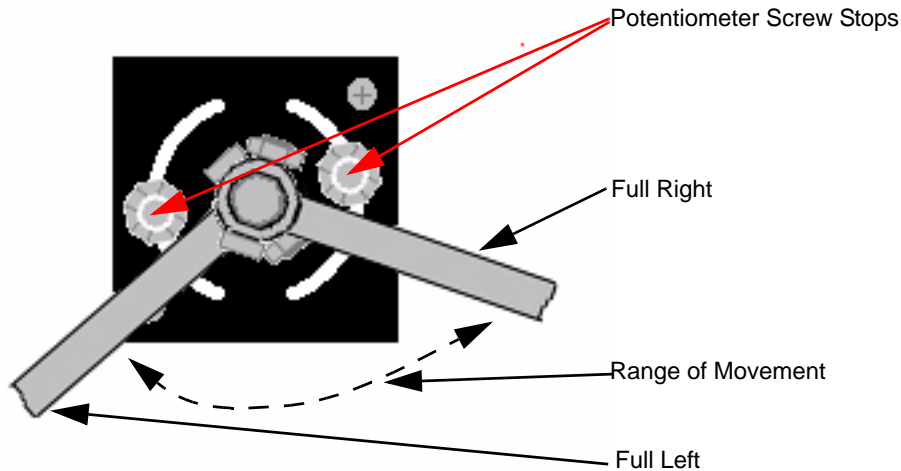
Figure 3-16 Wheels Turned Full Right



14. Repeat *Step 4.* through *Step 13.* until the linkage rod lengths have been adjusted and the potentiometer is centered to obtain the maximum sensor movement.

Note: The maximum movement is reached when the Wheel Angle Sensor rod sweeps from approximately 3/16 inch (5mm) from the screw stops when the wheels are turned to the maximum right and left positions. See *Figure 3-17.*

Figure 3-17 Maximum Sensor Movement (as seen from bottom)



Note: An Ohm meter can also be used to determine if there is enough sensor movement. Connect the Ohm meter to pins A and B of the Wheel Angle Sensor. Measure the Ohm reading at the maximum left and right position. After subtracting the smaller number from the larger number, there should be at least a 3.75 Kohms change. The reading should also never go below 1.6 or higher than 6.6 Kohms as this is reaching the limits of the potentiometer and could damage the sensor.

15. Tighten all linkage rod jam nuts.
16. Tighten the bolt securing the two linkage rods together. See *Figure 3-18*.

Figure 3-18 Linkage Rod Ball Joint Bolt (different vehicle shown)



17. Tighten the screw on the sensor shaft. Use a 1/8" hex key and a 3/8" wrench. See *Figure 3-19*.

Figure 3-19 Wheel Angle Sensor Shaft Tightening (different vehicle shown)



18. Secure the Wheel Angle Sensor cable along the bracket top using cable ties, after the SAM harness is installed.

Note: The AutoSteer system must be fully functional before you can perform *Step 19*.

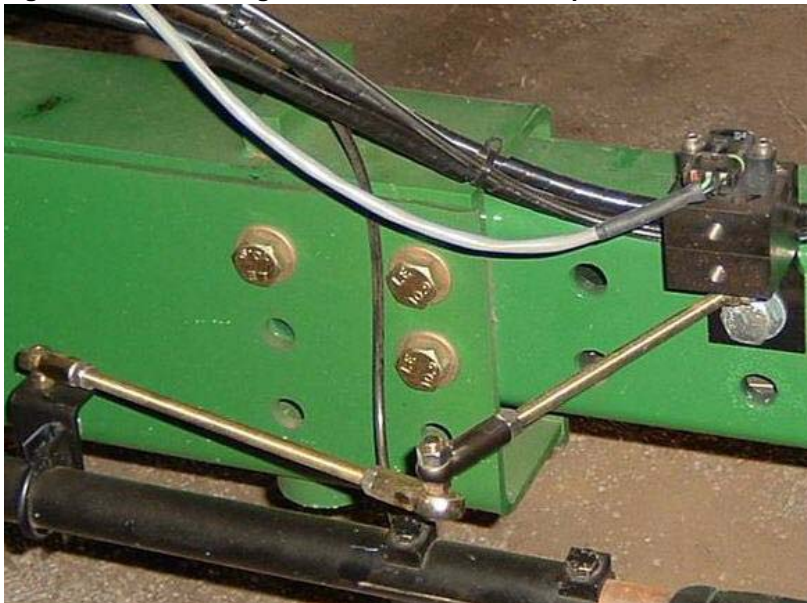
19. Adjust the arm length until there are approximately 48000 counts from the Wheel Angle Sensor using the AutoSteer diagnostics screen.

Note: If necessary, shorten Rod A to increase the Wheel Angle Sensor counts.

20. Tighten all jam nuts and fasteners.

21. *Figure 3-20* shows the completed Wheel Angle Sensor installation.

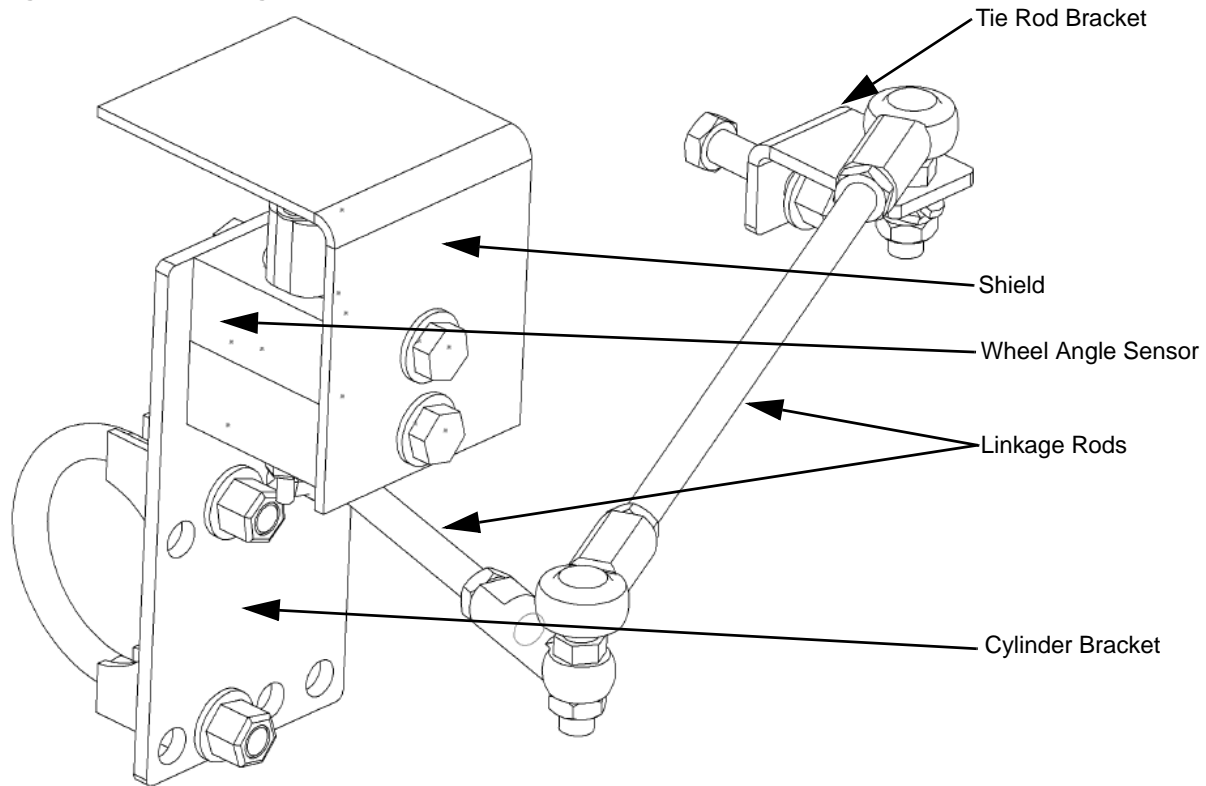
Figure 3-20 Wheel Angle Sensor Installation Complete



9000 CTS Wheel Angle Sensor Installation Procedure

Figure 3-21 shows the 9000 CTS Non-AutoTrac Ready combine Wheel Angle Sensor assembly fully assembled.

Figure 3-21 Wheel Angle Sensor Components

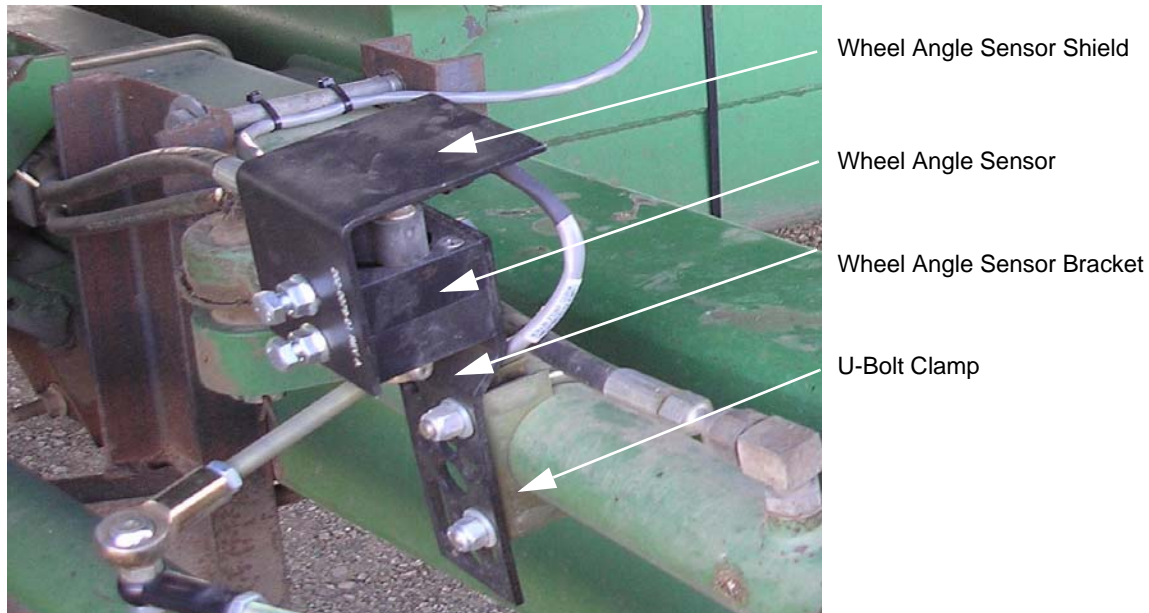


Mounting Wheel Angle Sensor Hardware

1. Mount the Wheel Angle Sensor bracket. See *Figure 3-22*.
2. Secure the cylinder bracket with the U-Bolt provided in your kit. See *Figure 3-22*.

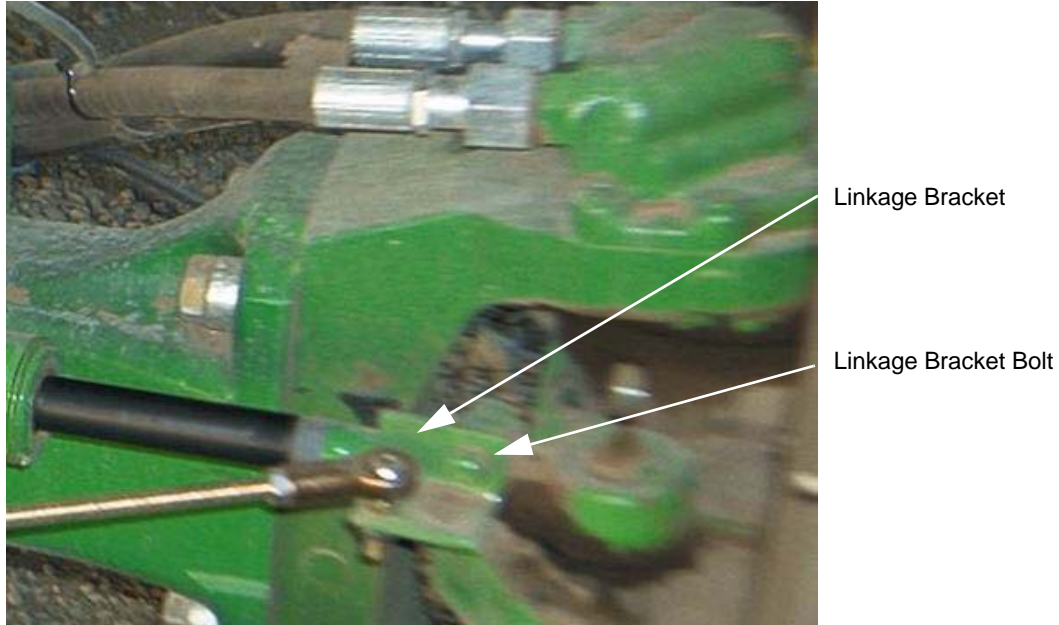
Note: Do not overtighten.

Figure 3-22 Wheel Angle Sensor Brackets Mounted



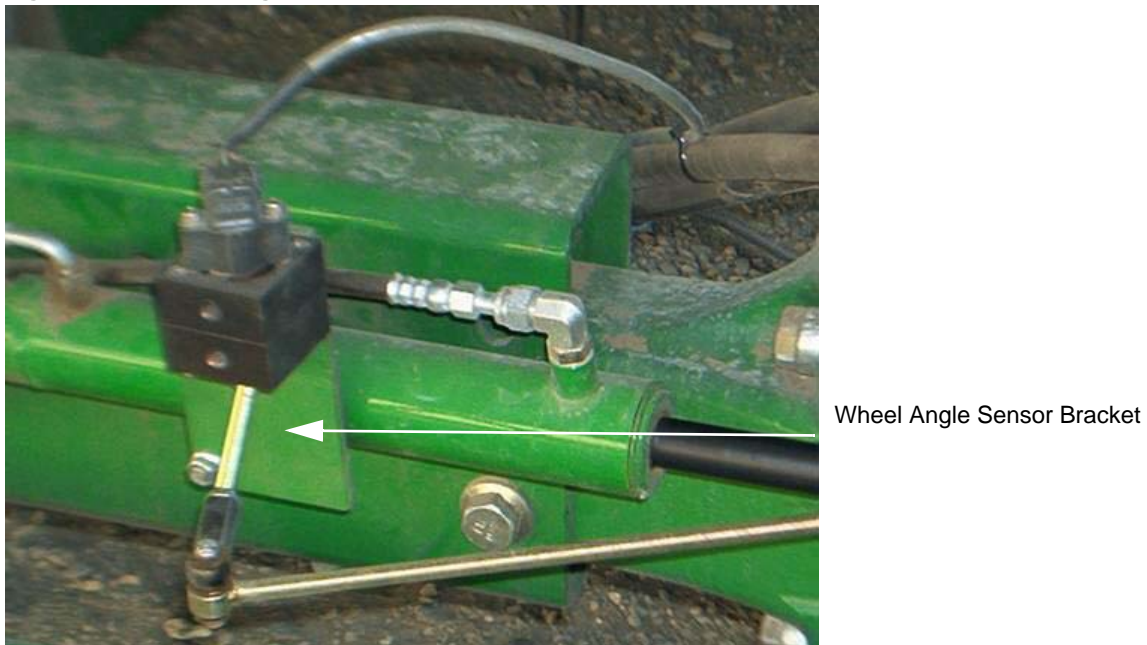
3. Mount the linkage rod L bracket by removing the existing steering cylinder bolt and replacing it with the bolt provided in your kit. See *Figure 3-23*.

Figure 3-23 Linkage Rod Bracket and Bolt



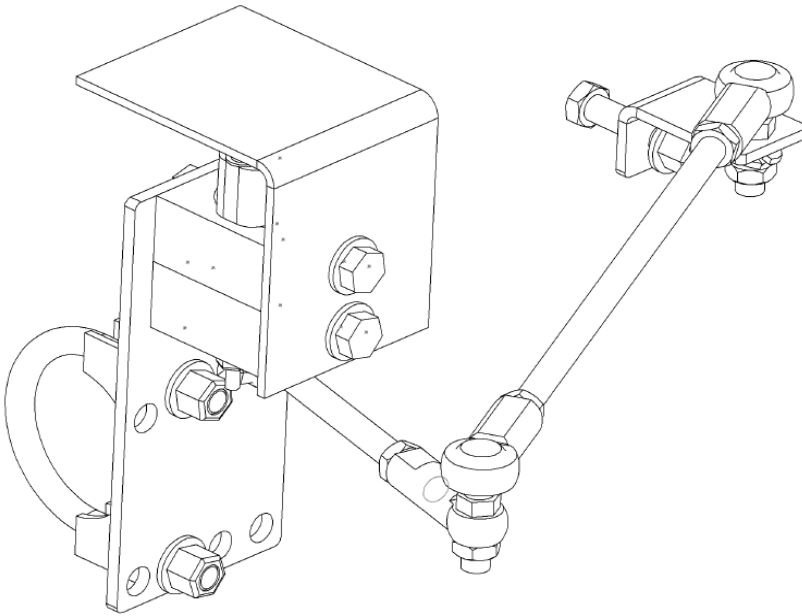
4. Secure the Wheel Angle Sensor to the cylinder bracket using the bolt provided in your kit. See *Figure 3-24*.

Figure 3-24 Wheel Angle Sensor and Bracket Mounted



Note: The threaded linkage rods must be cut to the correct lengths before final assembly. The linkage rods are shown assembled in *Figure 3-25*. See *Table 3-3* and *Table 3-4* for the cut and assembled linkage rod lengths.

Figure 3-25 Wheel Angle Sensor Assembly Assembled



Cutting Linkage Rods to Length

1. Measure and mark the two rods for cutting, according to the length shown in *Table 3-3*.

Note: Before cutting the linkage rods, verify the Wheel Angle Sensor brackets will attach to the vehicle as shown in this manual and they are attached the correct distance from any reference points shown. If this is not possible, do not cut the rods until it is determined if these lengths work for your installation. Due to possible variations in the mounting positions, these measurements could be different. These measurements are provided as a reference only. The installer is responsible for ensuring the rods are cut to the proper length.

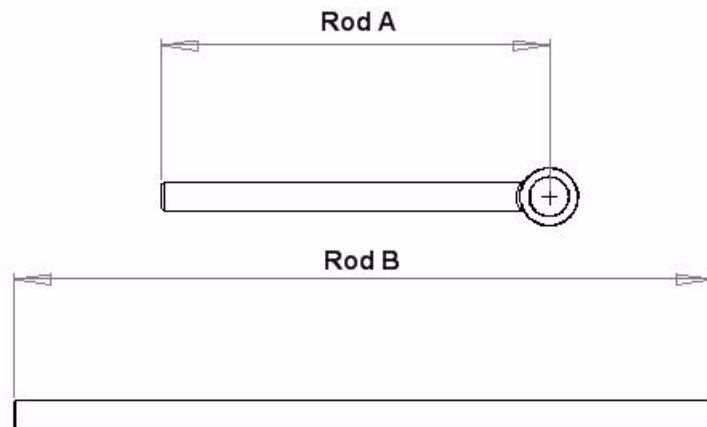
Table 3-3 Linkage Rod Cut Lengths

Item	Length
Rod A	4.5 inches (114 mm) ^a
Rod B	12.0 inches (305 mm) ^a

- a. This measurement is the rod length prior to assembly with the ball joints.

Note: *Figure 3-26* shows the measurement points used to properly cut the linkage rods.

Figure 3-26 Linkage Rod Cut Length Measurement Points



2. Use a hack saw to cut the linkage rod to length while it is held in a bench vise. See *Figure 3-27*.

Figure 3-27 Linkage Rod Cutting



Assembling Linkage Rod Hardware

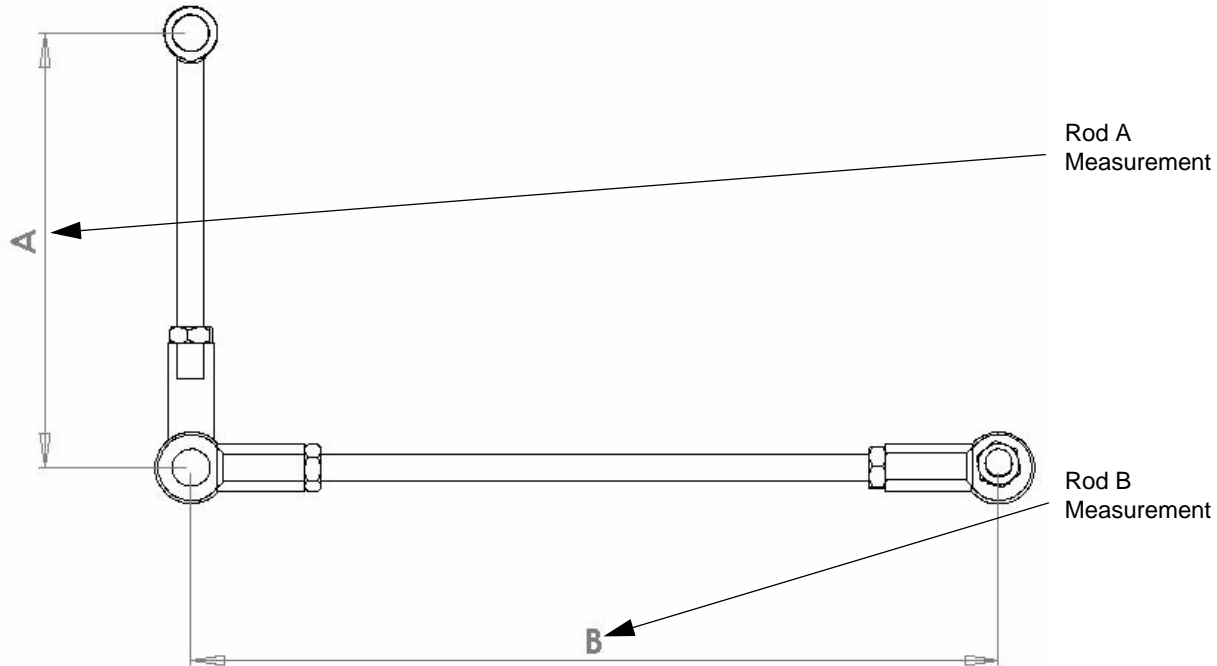
Note: The after-assembly center-to-center lengths of each linkage rod are shown in *Table 3-4*. *Figure 3-28* shows the measurement points for the assembled linkage rods.

Table 3-4 Assembled Linkage Rod Length

Item	Length
Rod A	5.5 inches (140 mm) ^a
Rod B	14.0 inches (356 mm) ^a

a. This measurement is the rod length after assembly with the ball joints.

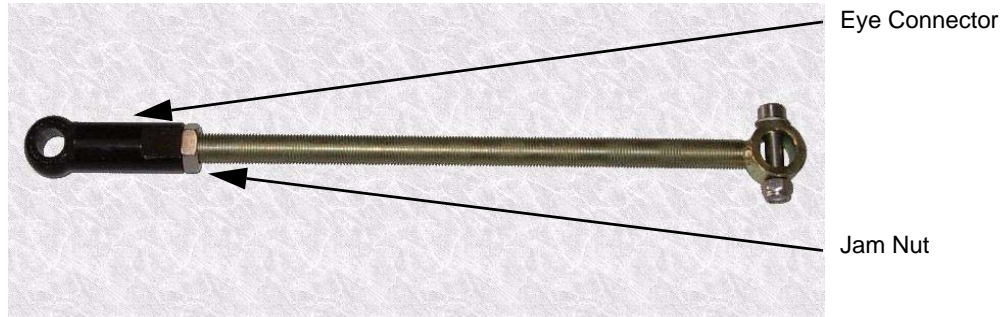
Figure 3-28 Linkage Rod (Assembled) Measurement Points



Note: The threaded rods must be cut to the correct lengths before final assembly.

1. Attach a jam nut to the Rod A end. See *Figure 3-29*.
2. Connect the eye connector to the Wheel Angle Sensor rod end. As shown in *Figure 3-29*.

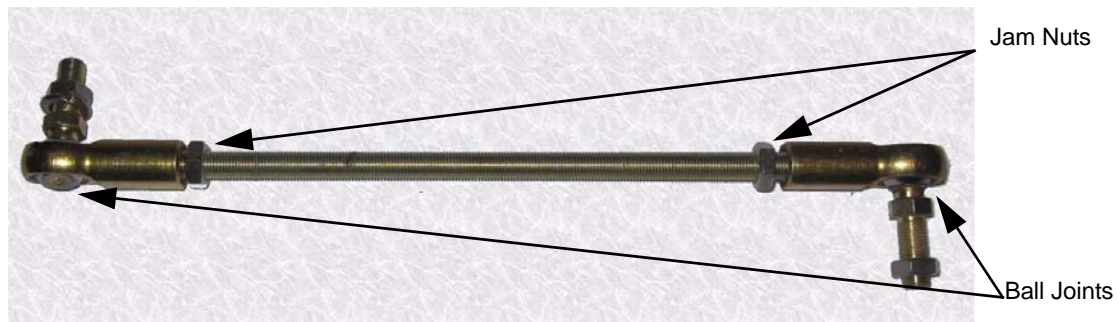
Figure 3-29 Rod A Assembled



3. Attach the jam nuts to each end of linkage Rod B
4. Attach the ball joints to both ends of the linkage arm as shown in *Figure 3-30*.

Note: This installation requires the bolts for the ball joints should be facing the direction shown in *Figure 3-30*.

Figure 3-30 Linkage Rod Assembled

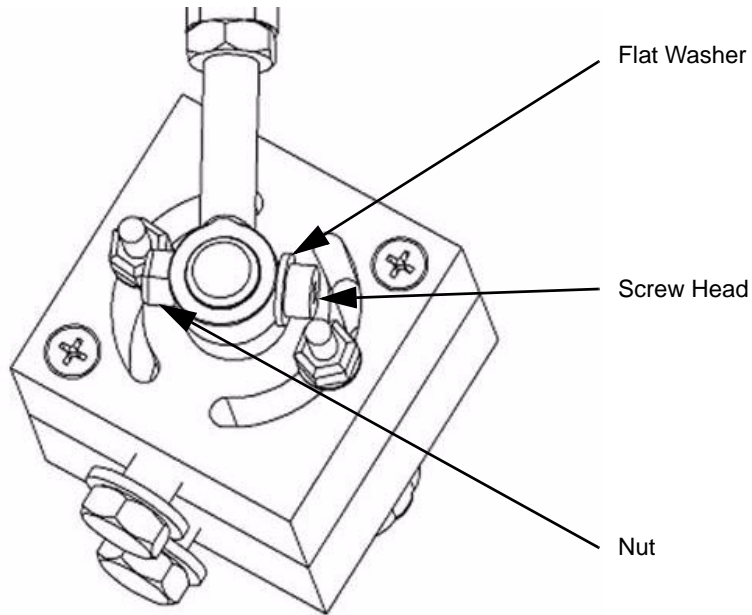


Attaching and Adjusting Wheel Angle Sensor Linkage Rods

1. Install the short linkage arm on the Wheel Angle Sensor shaft.
2. Ensure a flat washer is placed under the screw head when attaching the linkage rod to the sensor shaft. See *Figure 3-31*.

Note: The washer should be on the bolt head side and not the nut side of the assembly.

Figure 3-31 Washer on Shaft Screw




Note: Do not turn the wheels or drive the combine before the Wheel Angle Sensor has been adjusted using the AutoSteer Calibration screens. The potentiometer can only rotate a maximum of 180 degrees and if it is rotated beyond its mechanical stops, it will be permanently damaged.

3. Install the long threaded linkage on the tie rod bracket using a ball joint.
4. With the linkage rods disconnected, turn the steering wheel so the wheels are centered (the vehicle will travel straight ahead when moving).
5. Temporarily attach the linkage rods.

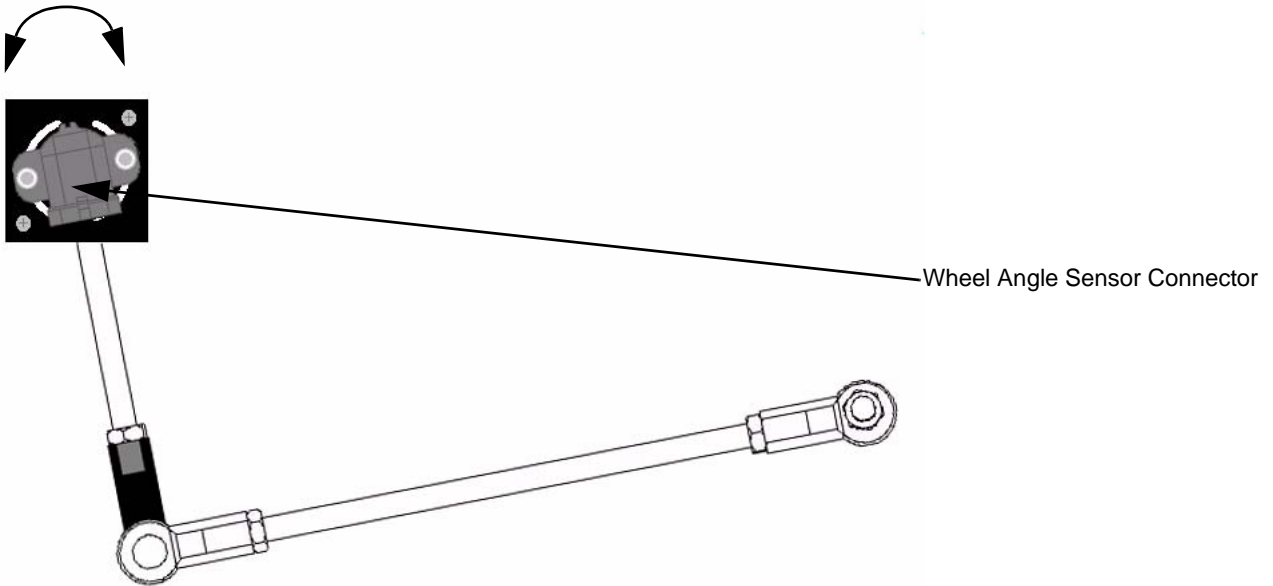
Note: Never leave the linkage rods attached to Wheel Angle Sensor rod and turn the steering wheels manually or automatically until the fit has been verified. The linkage rods must remain apart while the steering wheels are turned to the maximum right and left positions and then temporarily attached at these positions. Failure to disconnect the linkage rods may cause the Wheel Angle Sensor or vehicle to become damaged.

Note: After the linkage rods are assembled, they should move freely without touching any other parts and without overextending. Make any necessary adjustments to the linkage rods, if there is mechanical interference.

	<p style="text-align: center;">⚠ WARNING</p> <p>Always shut down the vehicle when working around the steering axle while checking and adjusting the Wheel Angle Sensor rod lengths. The steering axle could move suddenly and cause severe injury or death.</p>
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6. Rotate the Wheel Angle Sensor potentiometer on top of the mounting block so the wire connector is parallel to the Wheel Angle Sensor linkage rod.

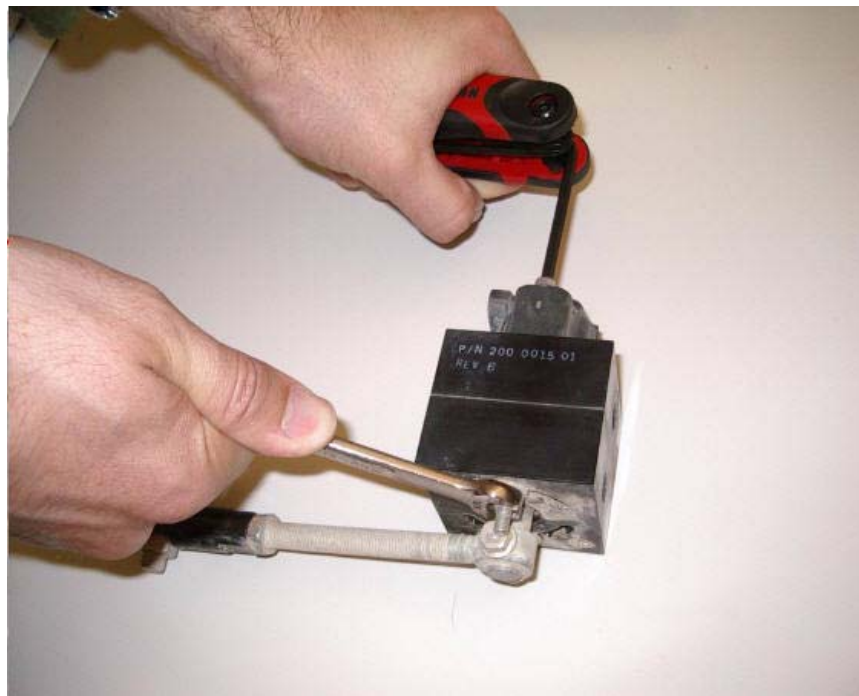
Figure 3-32 Adjusting Potentiometer Angle



7. Tighten the two screws securing the potentiometer to the Wheel Angle Sensor, after final adjustments. See *Figure 3-33*.

Note: Use a 5/32" hex key and a 3/8" wrench to secure the potentiometer. See *Figure 3-33*.

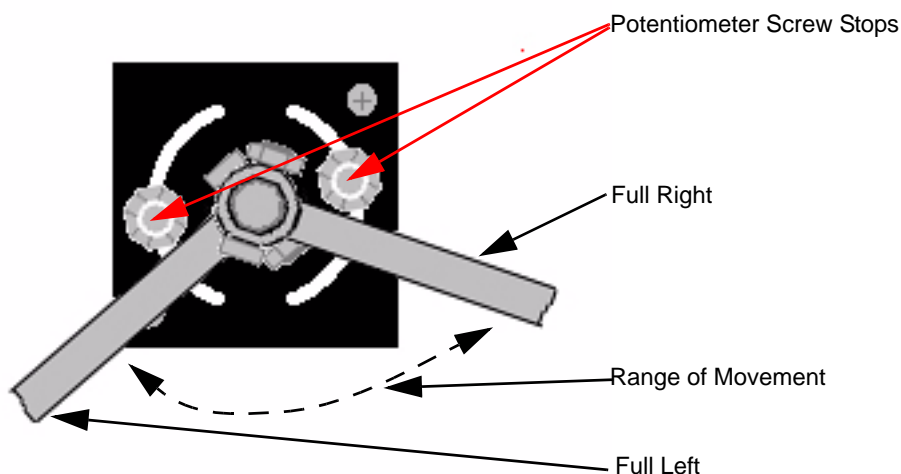
Figure 3-33 Wheel Angle Sensor Potentiometer (shown on bench)



8. Disconnect the linkage rods and turn the steering wheel manually to the full left position.
9. Reattach the linkage assembly and verify the sensor will not be damaged.
10. Adjust the linkage rod lengths as necessary.
11. Disconnect the linkage rods and turn the steering wheel manually to the full right position.
12. Reattach the linkage assembly and verify the sensor will not be damaged.
13. Adjust the linkage rod lengths as necessary.
14. Repeat *Step 4.* through *Step 13.* until the linkage rod lengths have been adjusted and the potentiometer is centered to obtain the maximum sensor movement.

Note: The maximum movement is reached when the Wheel Angle Sensor rod sweeps from approximately 3/16 inch (5mm) from the screw stops when the wheels are turned to the maximum right and left positions. See *Figure 3-34*.

Figure 3-34 Maximum Sensor Movement (as seen from bottom)



Note: An Ohm meter can also be used to determine if there is enough sensor movement. Connect the Ohm meter to pins A and B of the Wheel Angle Sensor. Measure the Ohm reading at the maximum left and right position. After subtracting the smaller number from the larger number, there should be at least a 3.75 Kohms change. The reading should also never go below 1.6 or higher than 6.6 Kohms as this is reaching the limits of the potentiometer and could damage the sensor.

15. Tighten all linkage rod jam nuts.
16. Tighten the bolt securing the two linkage rods together. See *Figure 3-35*.

Figure 3-35 Linkage Rod Ball Joint Bolt (different vehicle shown)



17. Tighten the screw on the sensor shaft. Use a 1/8" hex key and a 3/8" wrench. See *Figure 3-36*.

Figure 3-36 Wheel Angle Sensor Shaft Tightening (different vehicle shown)



18. Secure the Wheel Angle Sensor cable along the bracket top using cable ties, after the SAM harness is installed.

Note: The AutoSteer system must be fully functional before you can perform *Step 19*.

19. Adjust the arm length until there are approximately 48000 counts from the Wheel Angle Sensor using the AutoSteer diagnostics screen.

Note: If necessary, shorten Rod A to increase the Wheel Angle Sensor counts.

20. Tighten all jam nuts and fasteners.

21. *Figure 3-37* shows the completed Wheel Angle Sensor installation.

Figure 3-37 Wheel Angle Sensor Installation Complete



SA Module Installation

This **SA Module Installation** chapter contains information for mounting the SA Module bracket and installing the SA Module.

Note: The following procedure provides possible SA Module mounting instructions. However due to the variety of vehicle options available on vehicles and possible configuration differences, it may be necessary to install the SA Module in an alternative location. If an alternative location is required, choose a location where the SA Module can be protected from damage from moving parts or crop debris and excessive moisture from weather and cleaning equipment.

1. Mount the SA Module bracket on the vehicle frame side. See *Figure 4-1*.

Figure 4-1 SA Module Location



2. Identify the holes on the grain tank support. See *Figure 4-2*.

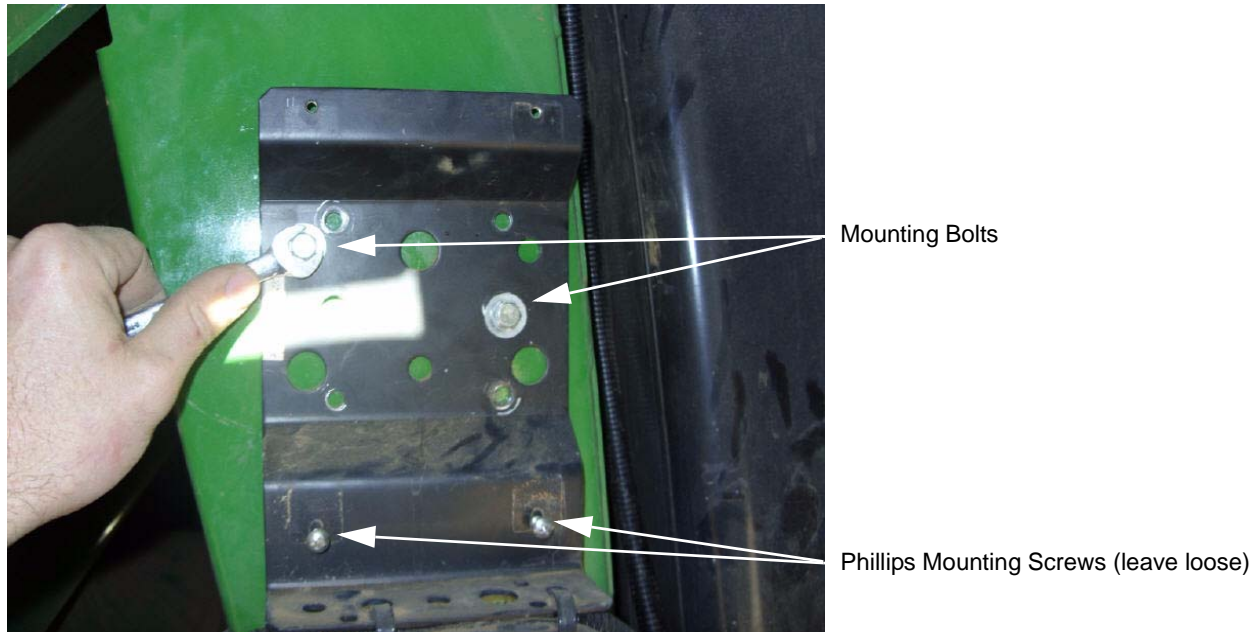
Note: If the holes shown in the *Figure 4-2* are not available drill two 8mm hole sin the grain tank support.

Figure 4-2 Mounting Holes



3. Attach the SA Module bracket as shown using the M8 x 20 bolts, nuts and fender washers as shown in *Figure 4-3*.
4. Tighten with a 13mm socket and a 13mm wrench. See *Figure 4-3*.

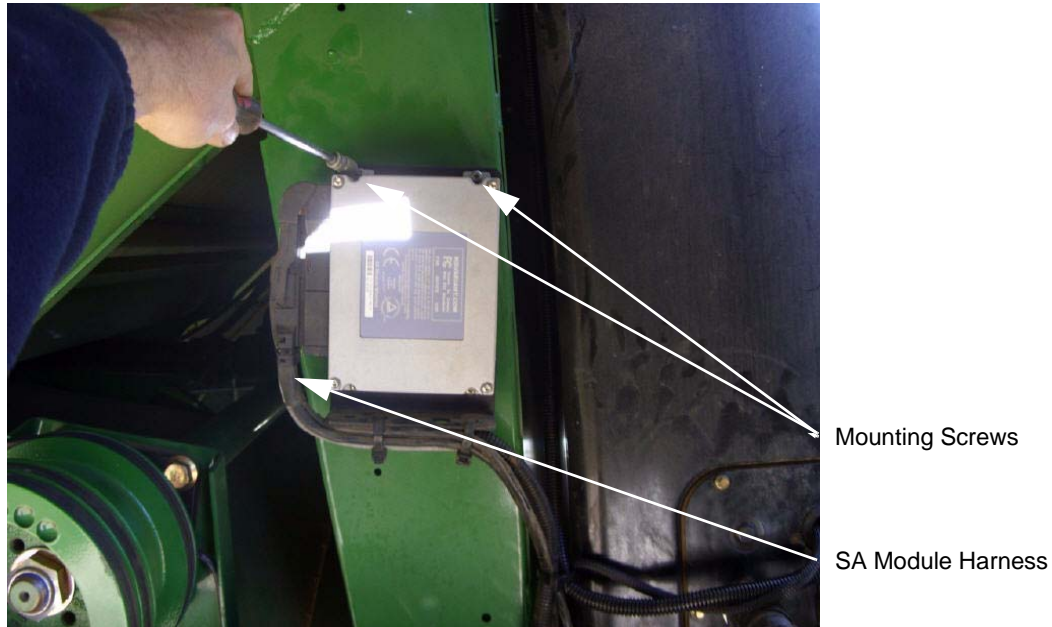
Figure 4-3 SA Module Bracket Mounted



5. Slide the SA Module into place.
6. Mount the SA Module into place by installing the remaining two screws. See *Figure 4-4*.

Note: Leave the phillip screws loose until after you have routed the SA Module harness and have connected it to the SA Module.

Figure 4-4 SA Module Mounted on the Bracket (shown with SA Module Harness attached)



Note: *Figure 4-5* and *Figure 4-6* show the correct and incorrect SA Module installation orientations.

Figure 4-5 Correct SA Module Orientation

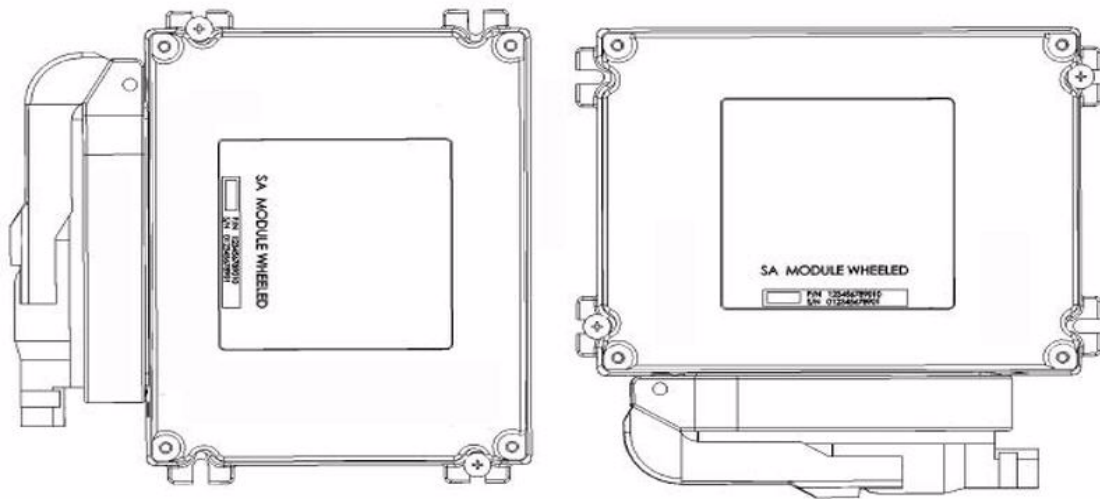
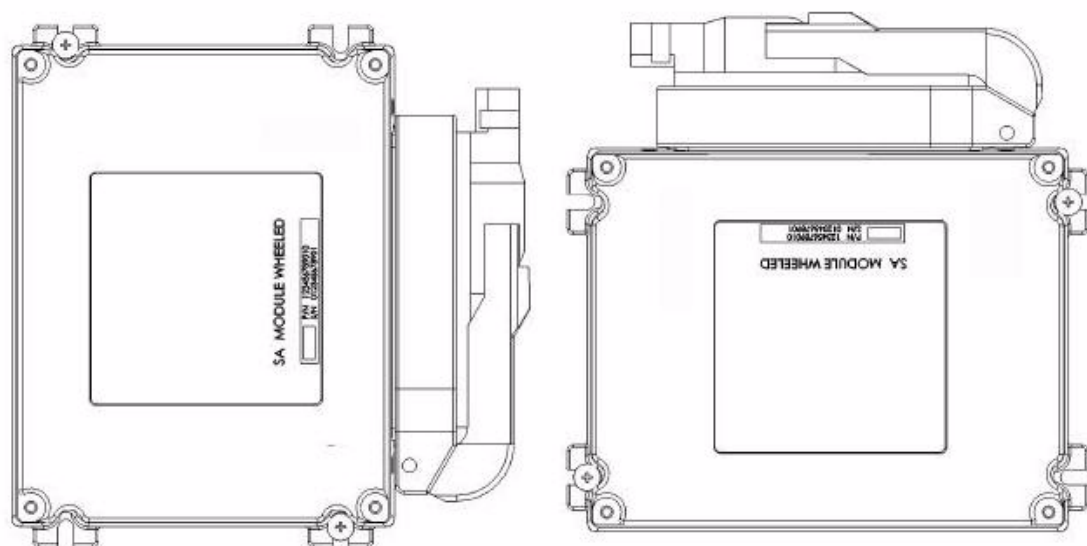


Figure 4-6 Incorrect SA Module Orientation


Roof Module Installation

This **Roof Module Installation** chapter contains information in the following sections:

- *Safety Notes*
- *Installation Procedure*

Safety Notes

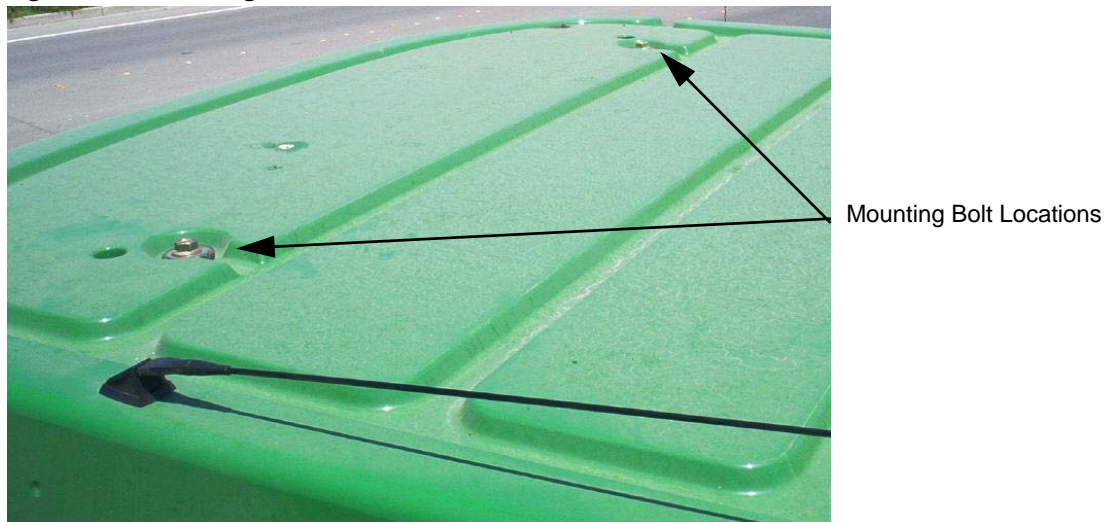
- The AutoSteer system must be powered OFF when installing or removing the Roof Module.
- The Roof Module must always be firmly secured to the Roof Rail using the hardware whenever the vehicle is in operation to prevent the Roof Module from releasing from its bracket and falling.
- The Roof Module must be removed when transporting the vehicle at speeds above 30 mph.
- Ensure you are in a safe position when attempting to access the cab roof. If necessary for safety, use a ladder to access the roof. Ensure you do not fall or drop the Roof Module.

	<p style="text-align: center;">⚠ WARNING</p> <p>To prevent injury from falling, ensure you are in a stable position on the vehicle when installing or removing the Roof Rail and Roof Module. If the vehicle does not provide a safe platform, use a ladder to safely access the vehicle roof while installing or removing the Roof Rail and Roof Module.</p>
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Installation Procedure

1. Access the cab roof.
2. Locate the two cab roof bolts. See *Figure 5-1*.
3. Remove the two bolts on each side. See *Figure 5-1*.

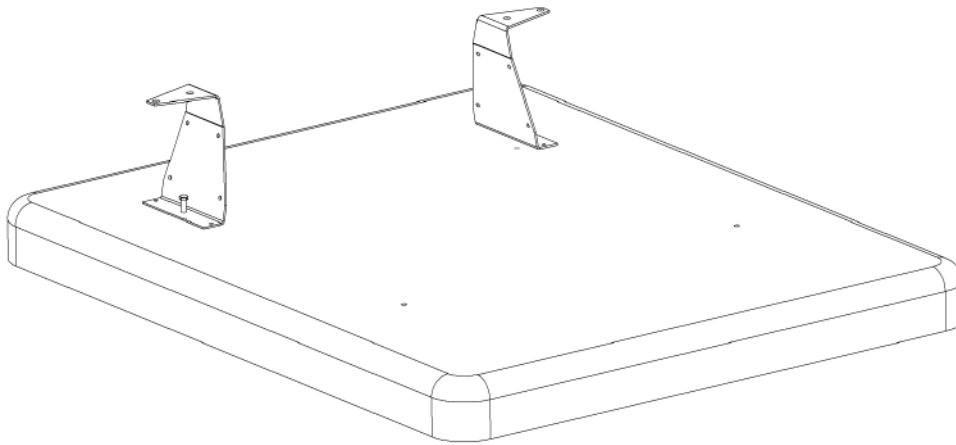
Figure 5-1 Mounting Bolt Locations



4. Align the mounting brackets to mounting holes.
5. Fasten the mounting brackets to the roof using the longer bolts and spare washers provided in the installation kit. See *Figure 5-2*.

Note: The bolt attaching the roof bracket to the cab roof mounts into a lowered channel on the roof surface. Place enough fender washers on the bolt hole under the bracket to make the top fender washer flush with the bottom of the bracket when the bracket is placed on the roof. These washers keep the roof from being bent as the bracket bolt is tightened.

Figure 5-2 Roof Module Mounting Brackets



6. Tighten the bolts using a 24mm socket and ratchet. See *Figure 5-3*.

Figure 5-3 Tightening Roof Module Bracket Bolts



7. Place the Roof Rail on top of the washers and center it over the cab.

8. Attach the Roof Rail to the mounting brackets using bolts, nuts and washers supplied. See *Figure 5-4*.
9. Tighten the bolts securely with a 24mm socket and ratchet. See *Figure 5-4*.

Figure 5-4 Mount Rail on Brackets



10. The Roof Rail is now installed on the brackets. See *Figure 5-5*.

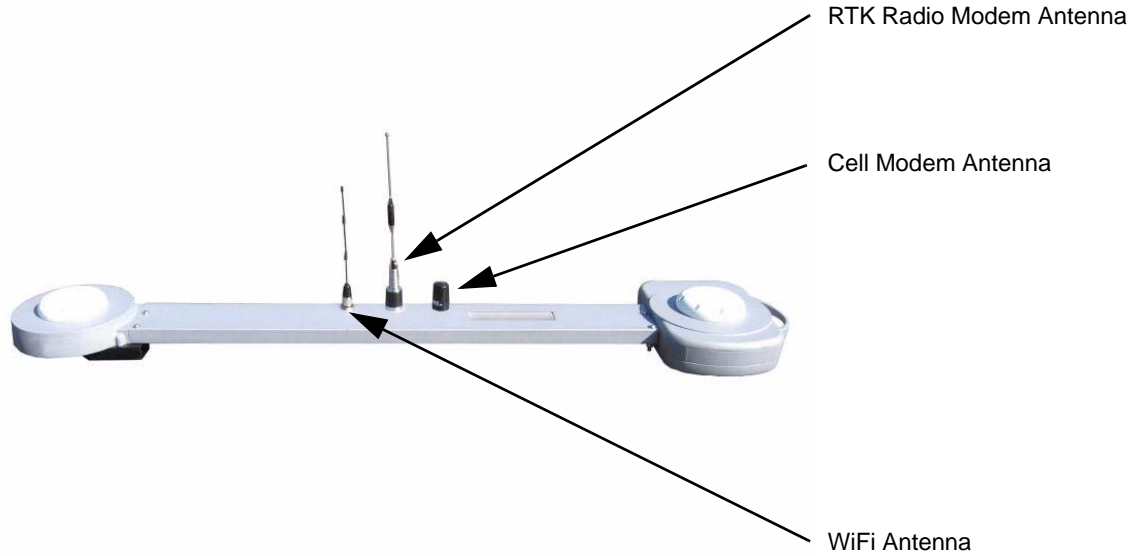
Figure 5-5 Rail Mounted on Brackets



11. Attach the three antennas to the proper Roof Module antenna connections. See *Figure 5-6*.

Note: Hand tighten the antenna connections. Do not over tighten.

Figure 5-6 Antennas Attached to Roof Module



12. Place the Roof Module on the Roof Rail. See *Figure 5-7*.

Figure 5-7 Mounting Roof Module on Roof Rail



13. Insert the locking pin into the Roof Rail. See *Figure 5-8*.

Note: Press the button on the pin handle end to enable pin insertion.

Figure 5-8 Inserting the Locking Pin



Locking Pin Button

14. The Roof Module is now installed. See *Figure 5-9*.

Figure 5-9 Roof Module Installed



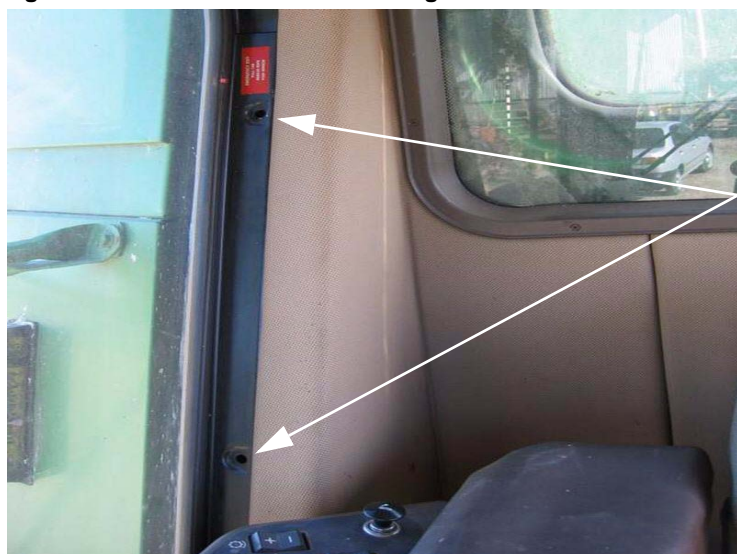
Display Installation

This **Display Installation** chapter contains information for installing the Display.

Installation Procedure

1. Locate the bolts holes on the cab right rear. See *Figure 6-1*.

Figure 6-1 Remove Plastic Mounting Hole Covers



Mounting Bracket Bolt Holes

2. Separate the brown wall panel from the window frame enough to gain access to insert and tighten the bolts. See *Figure 6-2*.

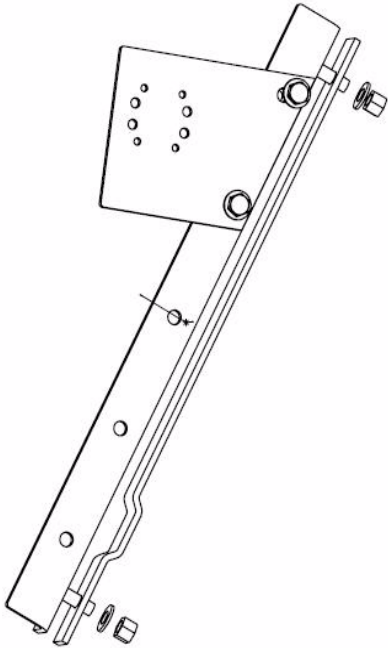
Note: To open the panel, pull the panel towards the vehicle front and away from the window simultaneously.

Figure 6-2 Opening Wall Panel for Bolt Access



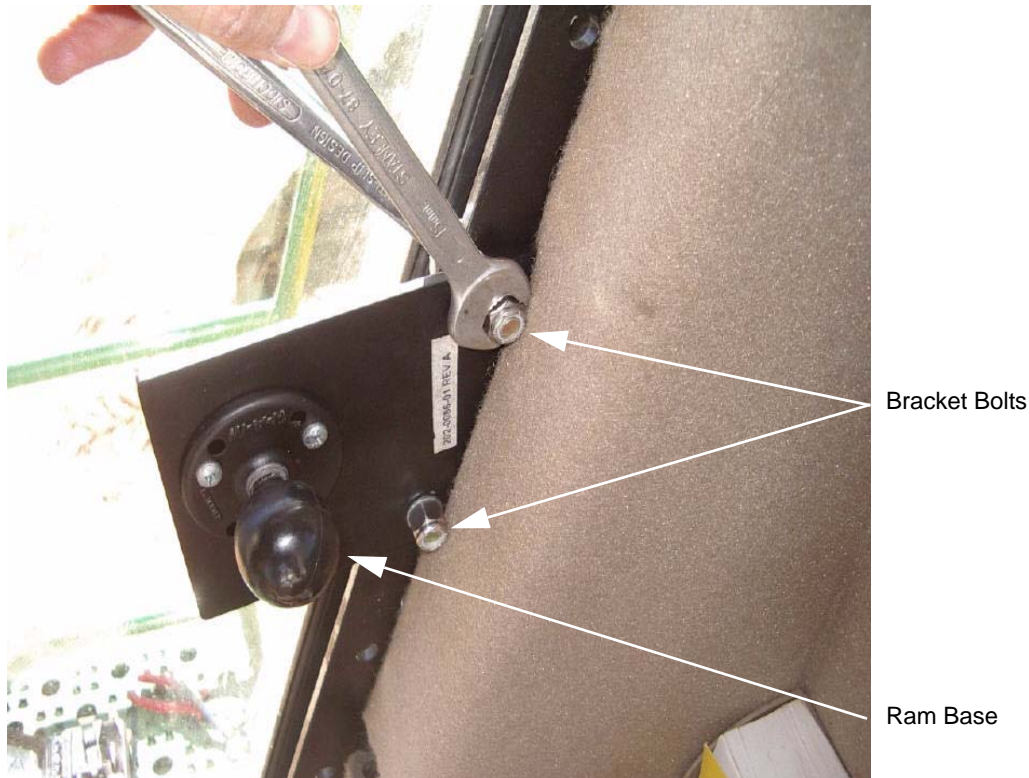
3. Mount the bracket assembly. Adjust the bracket height by selecting different bracket bolt holes as necessary. See *Figure 6-3*.

Figure 6-3 Display Mounting Bracket



4. Install the RAM Mount base ball (1-1/2" diameter) on the display mounting bracket. See *Figure 6-4*.
5. Secure the RAM base using four 10-32x3/4 Phillips screws and locknuts. See *Figure 6-4*.
6. Install the Display bracket using the two bolts provided. See *Figure 6-4*.

Figure 6-4 Mounting Display Bracket (shown with Ram Base installed)



7. Secure the display to the Ram Base using the mount arm.

Note: Refer to the display User Manual for the remaining display specific installation instructions.

Connecting System Cables

This **Connecting System Cables** chapter provides information in the following sections for connecting the Main Cable Harness and the SA Module Cable Harness to various vehicle and AutoSteer components:

- *SA Module Harness*
 - *SA Module Connection*
 - *Optional AutoSteer Wheel Angle Sensor*
 - *Steering Valve Connections*
- *Main Cable Harness*
 - *Roof Module*
 - *Display*
 - *SAM Harness*
 - *Main Cable Harness Connections Inside Cab*
 - *Power Supply Connections*

SA Module Harness

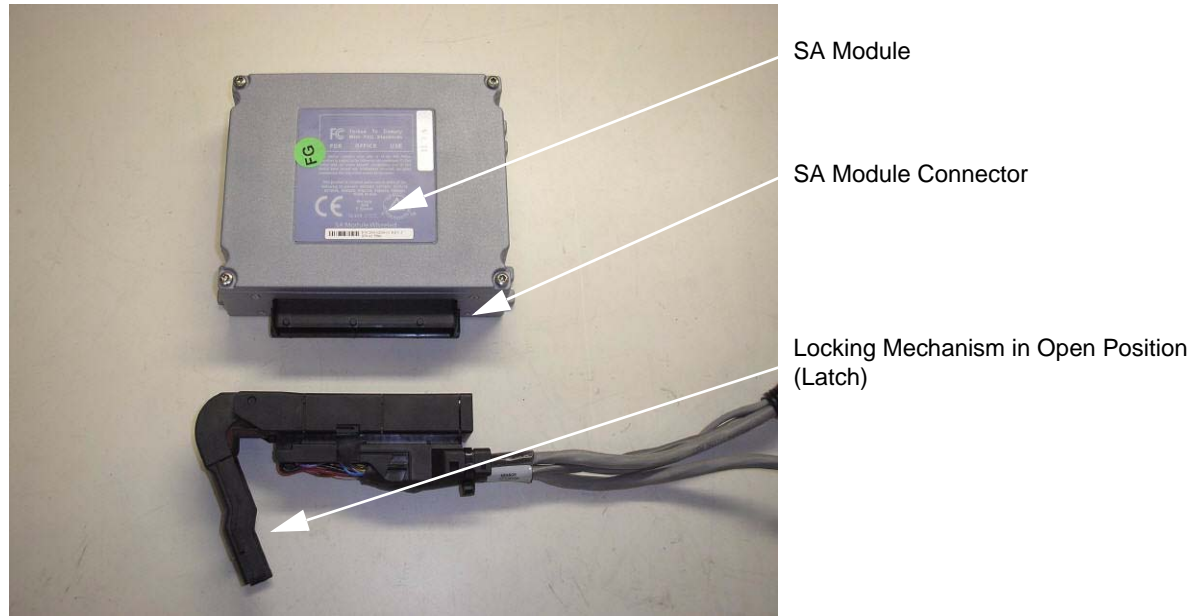
This **SA Module Harness** section contains the following sub-sections:

- *SA Module Connection*
- *Optional AutoSteer Wheel Angle Sensor*
- *Steering Valve Connections*

SA Module Connection

1. Align the SA Module Harness connector to the SA Module. See *Figure 7-1*.
2. Open the connector latch lever. See *Figure 7-1*.

Figure 7-1 Connecting SA Module Connector



3. Press the SA Module Harness connector onto the SA Module connector.

Note: You can damage the connectors if you force them into position. Do not force the connectors together or use tools.

4. Press the latch lever closed until it clicks and locks the connector. See *Figure 7-2*.

Figure 7-2 Closing the SA Module Connector



Note: If you need to disconnect the SA Module connector, you must open the latch lever before attempting to pull the connectors apart.

5. Close the cable connector locking mechanism as shown in *Figure 7-3*.

Figure 7-3 SA Module Connector (closed).



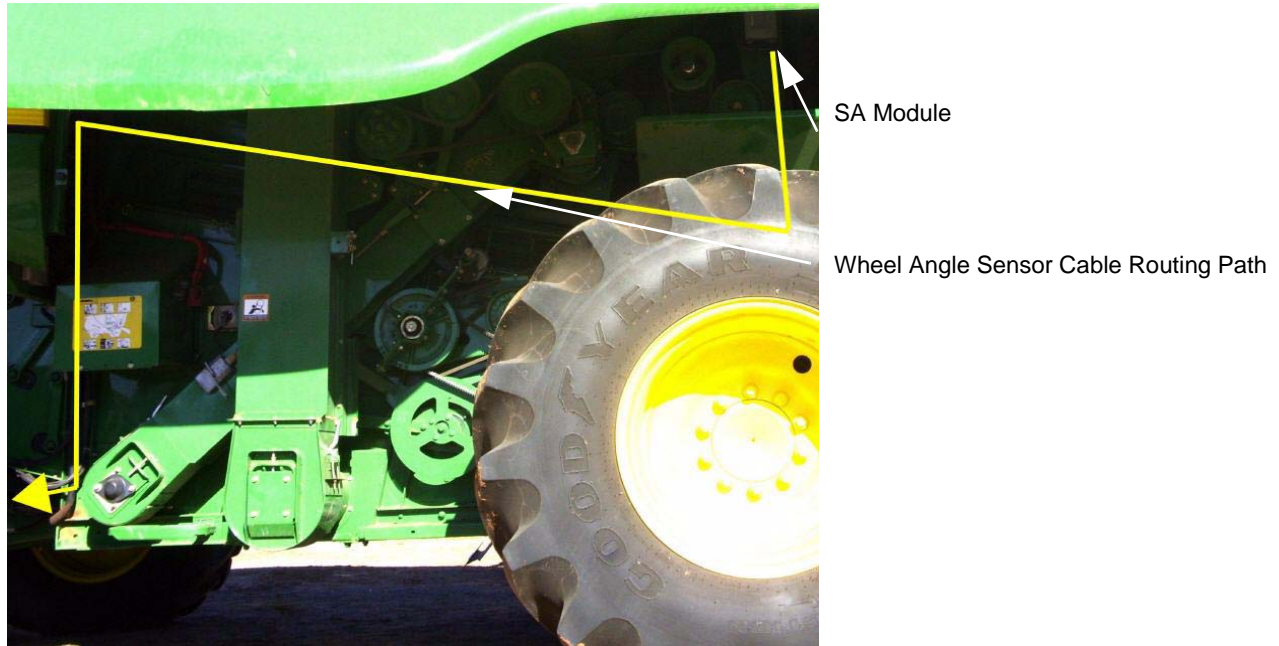
6. Route the cable toward the cab behind the right hand side window for connection to the Main Cable Harness.
7. Route the other half of the SA Module Harness under the cab towards the AutoSteer Valve and Wheel Angle Sensor.
8. Proceed to the *Optional AutoSteer Wheel Angle Sensor* procedure.

Optional AutoSteer Wheel Angle Sensor

1. Route the Wheel Angle Sensor along the right side of the combine frame, following the steering hydraulic hoses. Secure the Wheel Angle Sensor cable with cable ties.

Note: Keep all cables away from moving parts. If the SA Module Harness does not reach the Wheel Angle Sensor, use the extension harness PN: 201-0120-01.

Figure 7-4 Routing Wheel Angle Sensor Cable Along Hydraulic Lines



2. Attach the SA Module Harness connector to the Wheel Angle Sensor. See *Figure 7-5*.

Figure 7-5 Wheel Angle Sensor Connection



3. Secure all cables with cable ties.

Steering Valve Connections

1. Ensure the Pressure Transducer is installed. See *Figure 7-6*.
2. Connect the SA Module Harness connector to the Pressure Transducer. See *Figure 7-6*.

Figure 7-6 AutoSteer Valve Transducer Connection (shown on bench)



3. Connect the 4-pin SA Module Harness connector to the AutoSteer Valve. See *Figure 7-7*.

Figure 7-7 AutoSteer Valve 4-Pin Connection (shown on bench)



4. Connect the 10-pin SA Module Harness connector to the AutoSteer Valve. See *Figure 7-8*.

Figure 7-8 AutoSteer Valve 10-Pin Connection (shown on bench)



Main Cable Harness

This **Main Cable Harness** section contains the following sub-sections:

- *Roof Module*
- *Display*
- *SAM Harness*
- *Power Supply Connections*

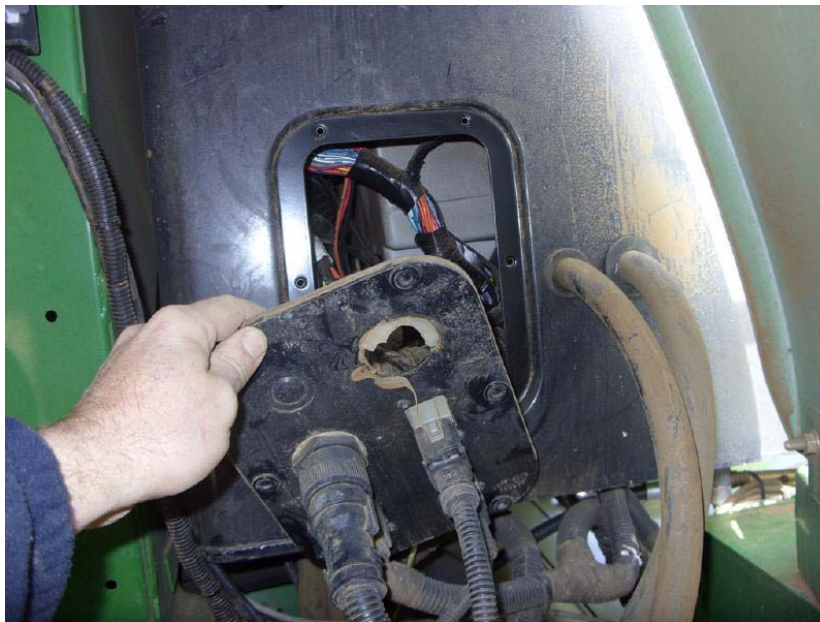
Roof Module

1. Remove the six (6) bulkhead panel screws to loosen the panel for easier cable transfer through the bulkhead. See *Figure 7-9*.
2. Remove the preformed blanking plug from the cover plate.

Note: A 1 3/4" hole saw may be required to remove the blanking plug.

Note: Use the rubber grommet provided in the Installation kit to protect the cables.

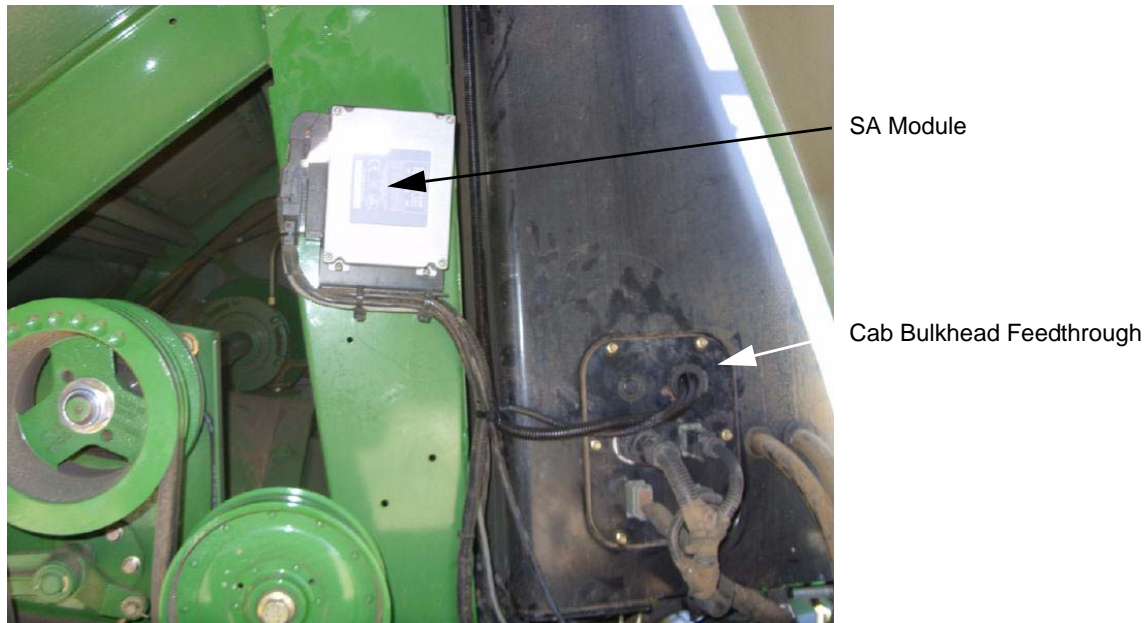
Figure 7-9 Bulkhead Panel Detached (different vehicle shown)



3. Route the Main Cable Harness cables out through the cab bulkhead. See *Figure 7-10* through *Figure 7-12*.

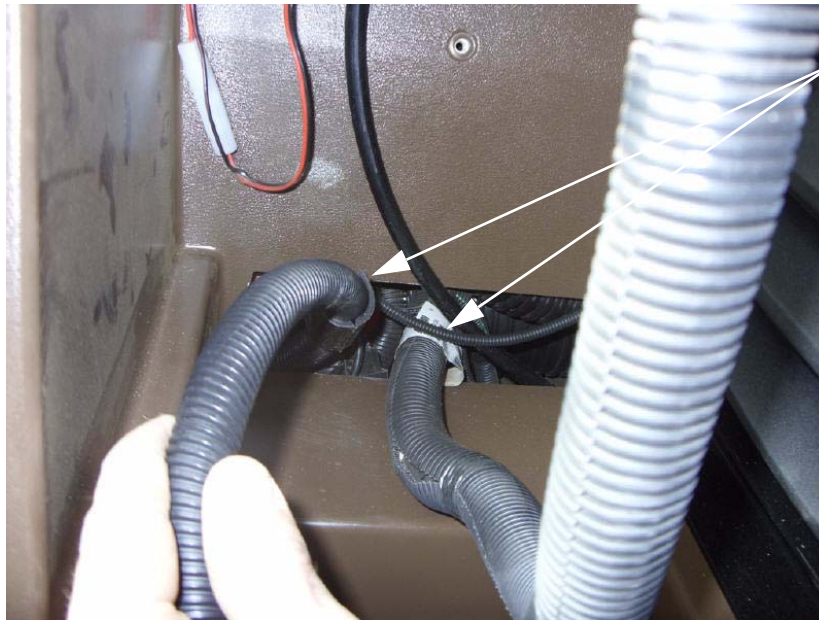
Note: The cab bulkhead feedthrough is located behind the plastic panel directly above the right front vehicle tire. You need to open and lift the panel to access the cab bulkhead feedthrough. Once the panel is lifted you can see the cab bulkhead feedthrough just to the right of the SA Module. See *Figure 7-10*.

Figure 7-10 Cab Bulkhead Feedthrough Location (different vehicle shown)



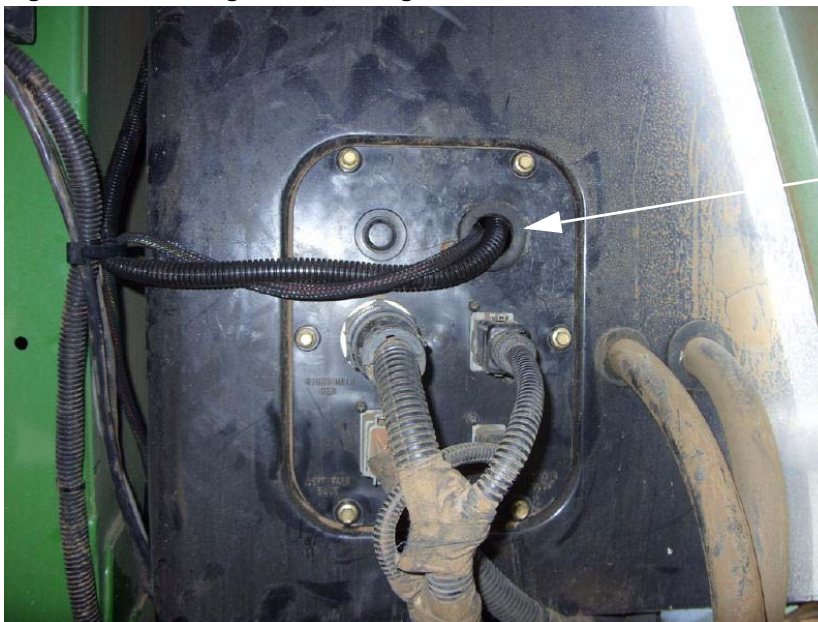
4. Pull Main Cable Harness through slot in cowling next to seat. Leave the bulk of unused harness behind cowling. See *Figure 7-11*.

Figure 7-11 Pulling Main Harness Cables Through Cowling



Pulling Cables Through Cowling

Figure 7-12 Routing Cables Through the Cab Bulkhead



Main Harness Cable Feedthrough

5. Route the antenna cable up the cab rear right-hand side. See *Figure 7-13*.

Figure 7-13 Routing Antenna Cable up Cab



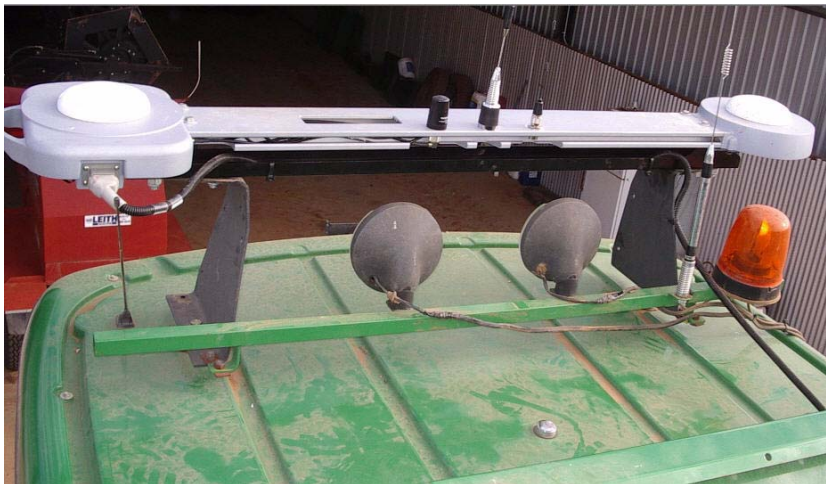
6. Attach the cable to the roof using a **P** clamp. See *Figure 7-14*.

Figure 7-14 Secure Main Harness to Cab



7. Route the Main Cable Harness across the roof and along the rail to the roof module connector. See *Figure 7-15*.

Figure 7-15 Routing Main Cable Harness Cable Across Roof Module Rail



8. Connect the Main Cable Harness to the Roof Module connector. See *Figure 7-16*.

Figure 7-16 Connecting the Main Harness to Roof Module (different vehicle shown)

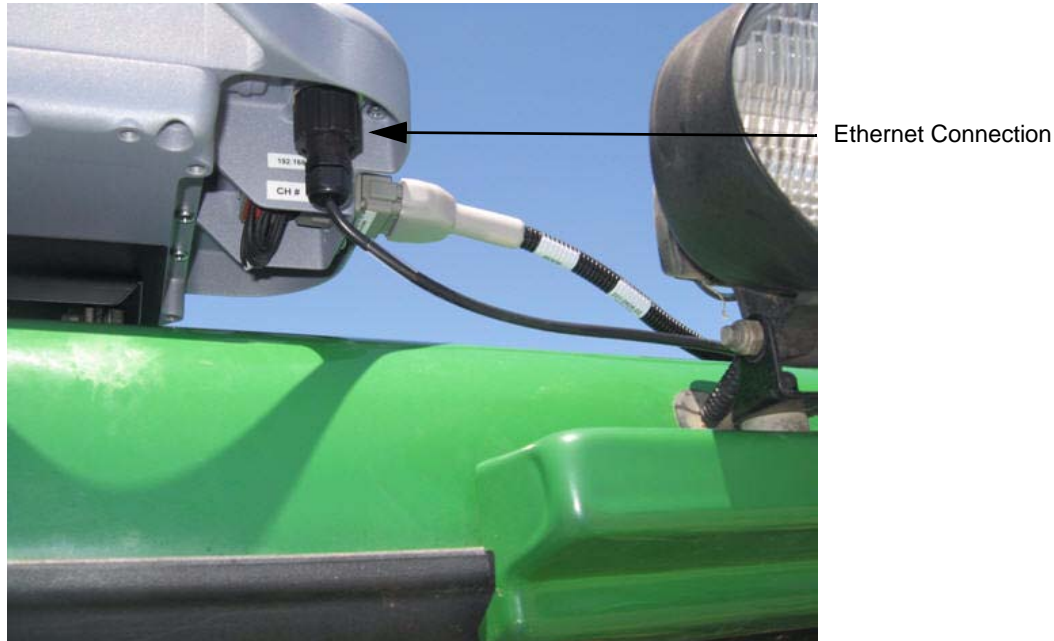


9. Orient the 12-pin connector so the word TOP on the cable connector is pointing upwards (towards the sky).
10. Insert the cable connector into the Roof Module. Push the connector in until it clicks and locks in place. To remove, grasp the connector to compress the two side latches and pull away from the Roof Module.

Note: Do not force the connector. If the connector does not engage easily, check the connector orientation.

11. Connect the Ethernet cable to the Roof Module. See *Figure 7-17*.

Figure 7-17 Roof Module Ethernet Connection (different vehicle shown)



- 12.** Orient the Ethernet cable connector with the connector under the receiver so the contacts on the cable connector are pointing towards the back of the vehicle.

Note: This orientation is usually towards your right side if you are standing on the vehicle left side and looking towards the Roof Module.

- 13.** Slide the cable connector into the receiver and rotate the plastic bayonet sleeve clockwise to lock the connector.

Note: The bayonet sleeve will click when it fully engages and locks. To remove the cable, rotate the bayonet sleeve counterclockwise until it clicks and pull the connector down or away from the Roof Module.

Note: Do not force the connector. If the connector does not engage easily, check the correct orientation of the connector.

Display

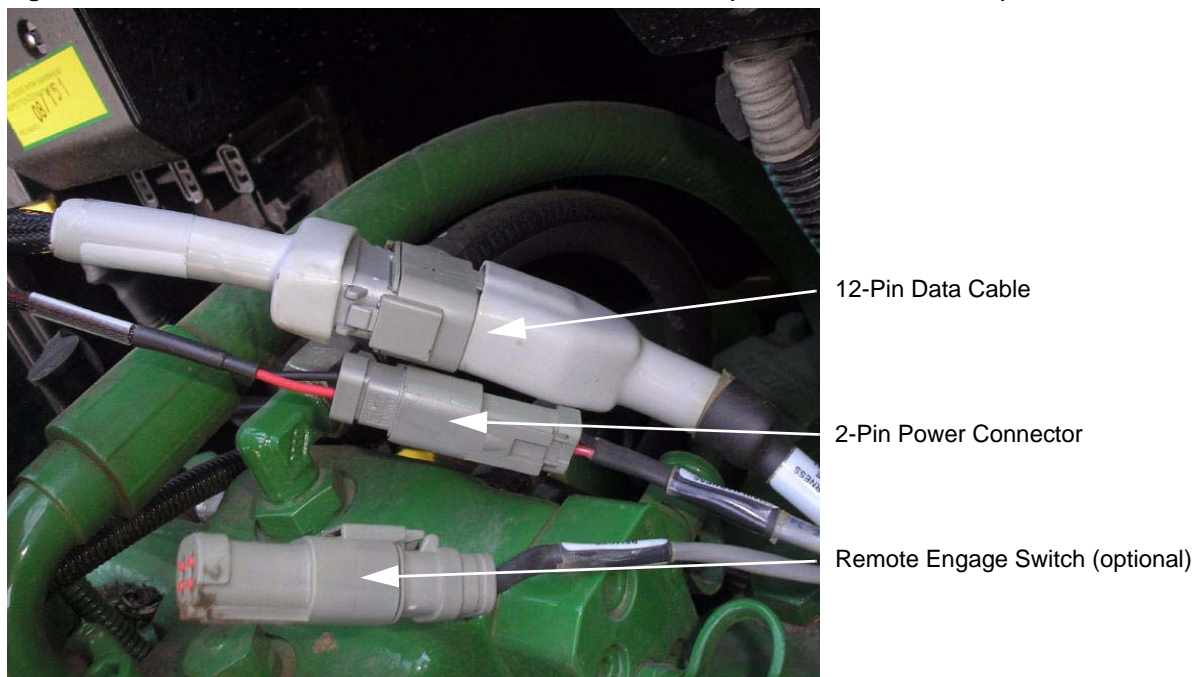
1. Attach the Main Cable Harness to your Display harness.

Note: Refer to your Display Owners manual for details on connecting the display harness.

SAM Harness

1. Connect the 12-pin data and 2-pin power connectors between the Main Cable Harness and the SAM Harness. See *Figure 7-18*.

Figure 7-18 SAM Harness to Main Cable Harness Connections (different vehicle shown)



Main Cable Harness Connections Inside Cab

Figure 7-19 shows the Main Cable Harness connections used inside the cab. Table 7-1 shows the Main Cable Harness cab connector functions.

Figure 7-19 Main Cable Harness Cab Connections

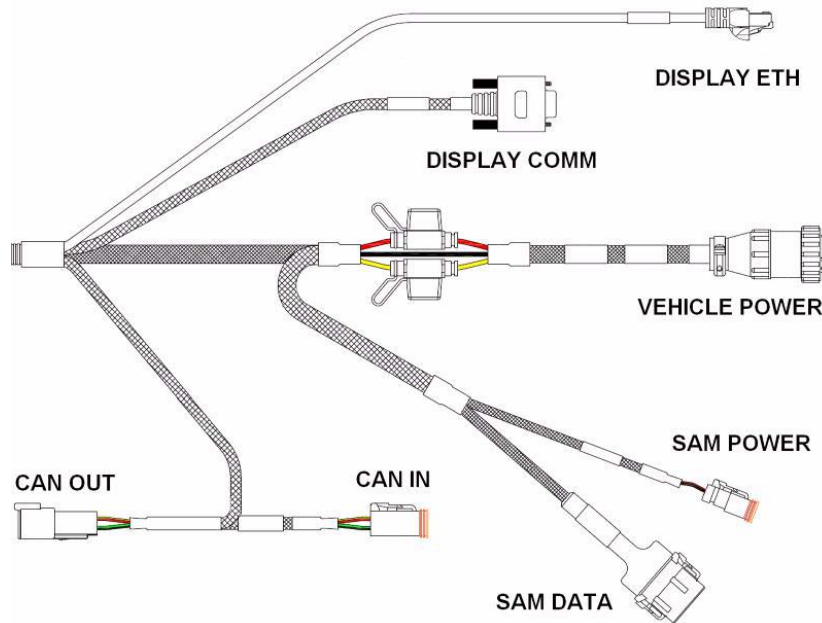


Table 7-1 Cab Main Cable Harness Connector Functions

Main Cable Harness Connector	Connector Function
DISPLAY ETH	Display Ethernet Port (RJ-45)
DISPLAY COMM	Display Communication Port (DB-9)
VEHICLE POWER	12 Volt Power Supplied by Display Harness
SAM POWER	Power for SA Module
SAM DATA	Data for SA Module
CAN IN	Not Used in this Installation
CAN OUT	Not Used in this Installation

Power Supply Connections

The following sub-sections describe basic instructions for connecting the AutoSteer system to available vehicle power sources:

- *Cab Power Connection*
- *Battery Power Connection*

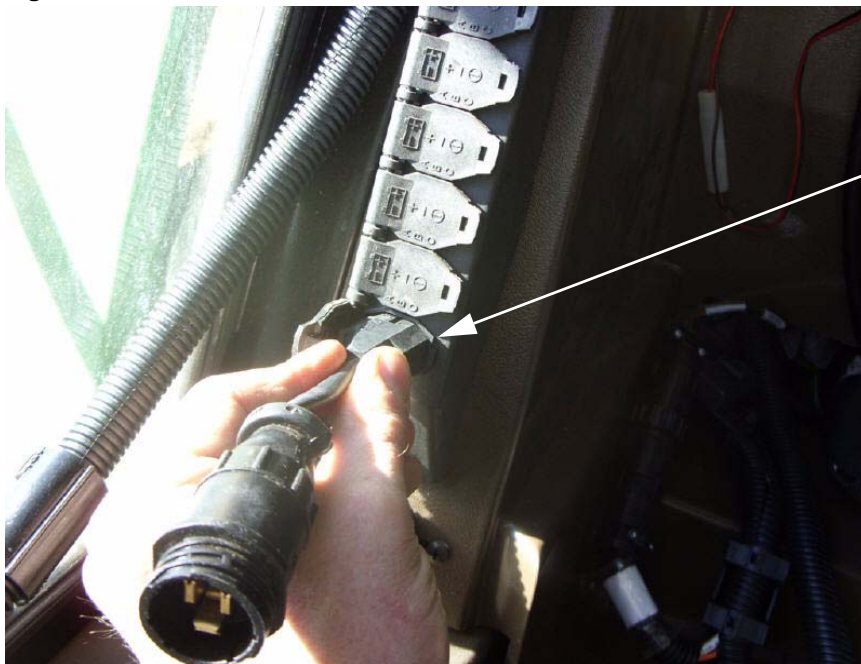
Note: Refer to your display user manual before connecting the AutoSteer system to vehicle power.

The AutoSteer Main Cable Harness must be connected to a 3-pin 12V power source. Your display user manual provides specific instructions for connecting power to the AutoSteer system and specifies the appropriate vehicle power source.

Cab Power Connection

1. Locate the cab console right-side 12V power outlet. See *Figure 7-20*.
2. Use this 12V accessory power connector if the display manual specifies connecting to power inside the cab.

Figure 7-20 Cab 12V Power Outlet



Cab Power Connection

Battery Power Connection

1. Locate the vehicle battery. See *Figure 7-21*.
2. Connect to the vehicle battery if the display manual specifies a direct battery connection.

Figure 7-21 Vehicle Battery Location



Battery Behind Panel

Note: A battery cable is provided with the AutoSteer system when a direct battery connection is required.

Post-Installation Procedures and Information

This **Post-Installation Procedures and Information** chapter contains information on procedures and processes that should be performed after the installation process is complete. The information for this chapter is contained in the following sections:

- *Verify the Vehicle is Ready for AutoSteer*
- *Create a New Vehicle*
- *Calibration and Tuning Notes*
 - *Vehicle Specific Installation Calibration and Tuning Guidelines*

Verify the Vehicle is Ready for AutoSteer

1. Ensure all connectors are properly coupled.
2. Power ON the AutoSteer system.
3. Verify installation and system operation.

Create a New Vehicle

After the entire system has been installed, including the Display and Roof Module, the operator must create a new vehicle profile using the AutoSteer system. The vehicle profile configures the hardware and enables the Display to communicate with the various sensors and vehicle components.

Follow the procedure below to create a new vehicle:

1. Ensure that the vehicle is still in Park and/or the park brake is set to prevent the vehicle from moving.
2. Ensure the vehicle is off. Do not start the vehicle yet.
3. Power up the AutoSteer system
4. Follow the instructions provided in the display's user manual to create a new vehicle.

Calibration and Tuning Notes

Vehicle Specific Installation Calibration and Tuning Guidelines

Note: For optimal AutoSteer performance, the AutoSteer system must be fully calibrated and then tuned.

Note: Select the appropriate standard hydraulic vehicle model when setting up your vehicle on the AutoSteer system display.

Final Hardware Installation Checklist

This **Final Checklist** chapter contains the verifications steps necessary after the installation of the AutoSteer system.

Note: The Final Hardware Installation Checklist is on the back of this page. You should keep a copy of this checklist and manual for future reference when servicing the vehicle.

Machine Model: _____ Year: _____ Serial #: _____

Customer Name: _____

Location/Address: _____

AutoSteer Installation Kit Part Number: _____

NOTES

Name of Installer: _____ Date: _____

System Installation Checklist

1. Wheel Angle Sensor Installed and all fasteners are tight. ☐
2. Monitor Bracket Installed and all fasteners are tight. ☐
3. Roof Rail is installed and all fasteners are tight. ☐
4. SA Module is installed and all fasteners are tight. ☐
5. All cable ends are connected. ☐
6. All cables are secured with cable ties. ☐
7. Roof Module locking pin is installed. ☐

Hydraulic Installation Checklist

1. Valve bracket is installed and all fasteners are tight. ☐
2. Valve is installed and all fasteners are tight. ☐
3. All hose fittings are tight. ☐
4. Check for oil leaks on all hydraulic connections. ☐
5. All hoses are routed and secured with cable ties. ☐
6. Adjust the AutoSteer relief valve. ☐
7. Measure the standby pump pressure. ☐ Value_____
8. Measure the maximum pump pressure in AutoSteer mode. ☐ Value_____
9. Manual steering is normal after the AutoSteer installation. ☐

AutoSteer Performance Checklist

1. Complete AutoSteer system calibration. ☐
2. Complete AutoSteer system tuning. ☐
3. Check total Wheel Angle Sensor counts. ☐ Value_____
4. Line acquisition is satisfactory. ☐
5. On-line steering is satisfactory. ☐
6. Manual override (kick-out) is working. ☐
7. Steering speed from lock-to-lock is satisfactory. ☐ Value_____Sec.
8. Measure the MAX RATE LEFT. ☐ Value_____
9. Measured the MAX RATE RIGHT. ☐ Value_____

Note: See the *Calibration and Tuning Notes* section of the *Post-Installation Procedures and Information* chapter for additional information.
